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MEDICAL EDUCATION LOOKS AT GENERAL EDUCATION AND THE UNIVERSITIES

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The invitation to participate with a representative of the law in a discussion in which the professions look at general education is an honor that I deeply appreciate. Borrowing a term from my legal colleague I am happy to "present the case" for medicine. In keeping again with legal terminology, I presume I should "qualify myself" as a witness as best I can. I taught in country schools, then in a high school, later in the university, and finally in medical school, where, in addition to other duties, I enjoyed and suffered the vicissitudes of dean of faculty and students for 13 years. In my undergraduate years at the University of Chicago, I was much influenced and stimulated by personal educational contact with its great first president, William Rainey Harper. The continuation of my education has included 50 years of medical practice and the observation of educational results in medical students and on their medical careers. For professional educational theory, however, I must defer to my university colleagues.

EDUCATION

The educational problems of the three professions of the ministry, law, and medicine obviously differ in technical content, but it would seem that their fundamental educational requirements are essentially the same. The ministry and medicine have much in common; originally they grew up together. They share in the tragedies of sickness and death and in the guidance of parishioners and patients along lines of conduct that will avoid the penalties of infractions of moral and medical principles. The law and medicine are closely related in dealing with social and personal problems of individuals, with the administration of justice, and with medicolegal regulations developed through centuries of experience.

Education has been described as the "taking on of the arts and sciences, and of moral attitudes which make up the fabric of civilization." In this process educated people should acquire an appreciation of values, the ability to think, and the ability to see the relations of values to each other in human living. Unfortunately, as George Vincent put it, many people do not think; they merely rearrange their prejudices. The Harvard report on the goals of education stated the problem well. "The aim of education should be to prepare an individual to become an expert both in some particular vocation or art and in the general art of free man and citizen. Thus the two kinds of education, once given separately to different social classes, must be given to all alike. . . . The aim of general education may be defined as that of providing the broad critical sense by which to recognize competence in any field." The observation of Henry Morrison that "we do not learn what to do, but rather become the kind of people who will know what to do" is well exemplified in the quality of performance of physicians and of those in the other professions. How does the change to which the Harvard report refers relate to medical education, particularly to our current problems?

EARLY MEDICAL EDUCATION IN AMERICA

Some reference to the history of medical education in America will clarify the successive changes that have now culminated in the present close relation of medicine to other university disciplines. In the beginning, medicine had been closely associated with the priesthood. Its principal elements were a combination of superstition, empiricism, and observation. Out of observation and curiosity, in medicine as in other branches of learning, came science, which has grown in relative importance until superstition has been largely eliminated and empiricism is giving way to reliance on fact. Medicine, together with law and theology, developed in the monasteries and then in the universities—Padua, Montpellier, and Paris—and later in others, including Leyden, Oxford, and Cambridge. In 1765 when the first American medical school was founded in Philadelphia by John Morgan and William Shippen, students of medicine in America, as also in England, qualified by service as apprentices to established physicians; the more ambitious journeyed to London, Paris, Leyden, or Edinburgh to continue their medical studies. The Philadelphia school, patterned after Edinburgh, stated among its requirements for admission to candidacy that "such students as have not taken a Degree in Arts . . . satisfy the trustees and professors of the college concerning their knowledge of the Latin tongue and in such branches of Mathematics, natural and

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experimental Philosophy as should be judged requisite to a Medical Education. . . . It is further required that each student, previous to obtaining a Bachelor's Degree, shall have served a sufficient apprenticeship to some respectable practitioner in Physic, and be able to show that he has a general knowledge in Pharmacy." These requirements remained in force until the occupation of Philadelphia by the British in 1777.

Later, as medical schools increased in number, the college course, which had been at first an adjunct or review in completion of a serious medical apprenticeship, gained in importance while the quality of the apprenticeships deteriorated and offered only a nominal opportunity to the students, finally becoming merely a perfunctory item of a year's credit on the college course. In the absence of examining boards, independent of the schools, a school diploma was accepted as scholastic qualification for license to practice medicine. Competition among the increasingly numerous schools encouraged low standards of admission and performance, without the salutary control of a competent and independent examining authority. But despite the later separation of licensure from educational function, medical schools continued to increase to the number of 162, largely in response to the needs of a rapidly growing population. Some were poor, some good, and some affiliated or integrated with universities. Such were the conditions up to the decade of drastic reform in medical education at the beginning of the 20th century. Now there are 80 medical schools. All but six are now parts of universities, and all are of approved legal and instructional quality. Thus medical education in America, which began under university aegis, has, after a century of wandering, come back to university guidance and standards. The problem now is how medicine may further improve the quality of medical education and promote good citizenship by availing itself of the scholarly influence of the universities.

MEDICINE—AN ART OR A TECHNOLOGY

Medicine is an art as well as a technology. The growth of science, applied in myriad ways in medicine, has made possible marvelous advances in the diagnosis, treatment, and prevention of disease. In this achievement, medicine in its educational program has turned more and more to science and has frequently neglected cultural subjects that contribute to the art and humanitarian facets of medical practice. With the return of medical schools to closer university association, this fault, which grew during their century-long separation from universities, is now slowly being corrected. A sound technology based on science is requisite to medical progress, but good efficient professional medical care includes the heart as well as the head. Multiple acquisitions of bits of applied sciences have created another difficulty by favoring the formation of many subspecialties, which are taken up by young physicians before they have acquired by experience a broad foundation in clinical practice and a more mature judgment in dealing with human affairs and impulses. The picture of the patient himself is obscured by the shadow of a minor item administered by a technologist. Increase in scientific facts applicable to the problems of medicine has led to so great a multiplication of specialties and subspecialties that increasing numbers of physicians who are highly skilled in some difficult but relatively narrow special field have failed to acquire or appreciate the larger objectives of medicine in the care and cure of the sick patient. This trend toward surrender of a profession to a technology calls forth well-merited criticism of the medical profession, often expressed by the phrase "the passing of the family doctor."

While the younger physician must conserve his time and strength if he is to continue to grow in medicine, he should not forget that the greatest professional satisfaction in the practice of medicine is the close patient-physician relationship of the family doctor. The better-prepared physician of the future will keep abreast of the advances in technology but will still retain the ideals of medicine; the family doctor will not have passed—he will have improved. Medicine is not alone in this extreme technological departmentalization. In universities also the tremendous increase in scientific interests in the past 50 years resulted in vast university expansion. In making innumerable new appointments, university administrations have found it difficult or impossible to secure men who "combined their specialties with a sense of the relevance of general culture to all research." At the same time the university specialist, even when he is not a specialist in the natural sciences, has concerned himself so exclusively with methods and technology that the personal, the human side of life is often neglected. The increasing incorporation into medical practice of new scientific knowledge has thus weighted medical educational interests in favor of science and lessened the apparent importance of cultural subjects such as history, philosophy, languages, and literature. This does not prepare the medical student to know his future patients as men and women. It inclines him to treat disease as a purely technical problem. Some university educators even maintain that "times have changed" in education and that no longer should the student be obliged to spend his energies in study of subjects not directly concerned with science. This narrow concept proposes to conserve present time and effort at the expense of future general quality; it accepts the attainments of a technology but discards the dedication of a profession.

Premedical cultural education contributes to mental maturity and prepares the student to deal more effectively with the great masses of scientific data that later he must fit into his medical preparation for his life work. At this point "how to learn" is more important than "what to learn." A general cultural education not only is one of his most important immediately useful tools but also is a source of professional effectiveness in the art of medicine and affords entrance to the cultural satisfaction of later life. It is evident that not all prospective physicians will be willing to devote more than the minimum time requirement to cultural subjects, and perhaps some of them are well advised to get on with their technological studies. Not all students can be passed through the same mold. In subsequent years some of the more pragmatically inclined students will regret their haste, and a few may even fill in some of the educational gaps and come to enjoy the intellectual satisfactions they would otherwise miss.

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QUANTITY AND QUALITY

The "headlong growth of knowledge" and the "extension of education downward" have created new problems in university education as well as in secondary education and in medicine. The increase in population of cities and more recently of suburban communities has so greatly increased the school population that school authorities have difficulty in providing both school houses and qualified teachers. The demands of quantity have interfered with quality. It would appear that some universities also have at times suffered lapses in quality, the causes of which in part have arisen from inferior training of supposedly qualified students in secondary schools and from the popularity of the college idea in the minds of the public and of many students who are not really interested in acquiring a cultural education. The resultant lowering of the average quality of students through this dilution must be a painful experience to scholarly members of those faculties. The results of relaxation of such cultural educational standards as had been attained in medicine were well demonstrated in the last war. Besides the distraction and disturbance of general thinking, medicine suffered through the abbreviation of premedical preparation, the acceleration of the medical course with its condensation of four years into three, and the concentration of internships and residencies. To those of us who were faced with the medical emergency of the armed forces, the acceleration of the medical educational program seemed a necessary and therefore a permissible compromise to which we subscribed as a wartime measure, but we were well aware that educational standards were being sacrificed to immediate necessity.

In his hurried acquisition of prescribed facts, the student lacked time as well as strength for collateral reading; his jaded mind failed to respond to such impulses of curiosity as he might fortunately experience. The superior students felt this keenly; the weaker students never knew what they missed. This wartime temporary step backward in medical education, the ill-effects of which still linger, emphasizes the necessity of a peacetime further advance in cultural education at university levels.

SCIENCE AND THE HUMANITIES

In medicine, even though the medical schools are now largely under the technical guidance of universities, science has come to overshadow the cultural aspects of education. True, it is through the application of modern science, which itself has a definite cultural value, that medicine has achieved its vast accomplishments of the past 50 years in prevention and cure of disease and the lengthening of the span of human life by 20 years. But this prolongation of life in turn has produced new economic, social, and medical problems such as the possible postponement of obligatory retirement age and the medical care of the aging, which will only be solved by broadly educated men and women. The physician occupies a unique place in his community. He cares for the physical and mental ills of his patients, and as family advisor he is requested to pass judgment on a multitude of matters not directly related to medicine. He should be prepared also to accept leadership as a citizen in his community and, as opportunity presents, in the larger affairs of the nation.

In our country for the past 20 years assaults on our national ideals, inaugurated still earlier, have centered on medicine, already selected as a vulnerable point of attack in nations of Europe by socialistic and communistic forces. It is not without significance that programs in education sponsored by communist elements have recommended specialization at an increasingly early age. British medical educators now note with concern the ill-effects of socialized medicine on the motivations and quality of student applicants. In this reversion to inferior standards a "desire for achievement is being replaced by a search for security." To maintain medical standards, which are a significant part here of our national standards of living in the democracy of our republic, the prospective physician must have a basic knowledge of history and literature and economics, a broad and sound philosophy, and a willingness to work. We recall the words that MacMichael attributes to Radcliffe, the great English physician, philanthropist, and benefactor of Oxford, in the story of "The Gold-Headed Cane." Radcliffe said, "For as I have grown older, every year of my life has convinced me more and more of the value of education of the scholar and the gentleman to the thoroughbred physician." Radcliffe's 17th century comment has even greater significance at the midpoint of the 20th century. The ideal physician should be a cultured gentleman. This has nothing primarily to do with wealth; rather it is an expression of education, broad culture, character, kindliness, emotional stability, and inborn consideration for others. These qualities will serve well the public and the physician in his practice, just as politeness and consideration for others in driving a car on the highway will avoid many traffic accidents.

EDUCATION AND MEDICAL RESEARCH

The amazing growth of scientific knowledge, to which medicine owes much of its own achievements in the amelioration of suffering and the saving of lives, has come through the free mental activity of men trained to think rationally and at the same time to give free rein to their imaginations. While entirely new concepts occasionally necessitate an extensive rearrangement of previously held notions, the progress of today rests largely on the labor of yesterday. The man who proposes to engage in research requires first a broad general education in order that he may develop an ingrained critical sense, the first line of defense against wild and unworkable theories. Some men never acquire this discriminative ability, nor have they the diligence to learn what has already been done, and they fall victims to and sometimes become protagonists of procedures that in the end do harm to the cause of medical science. Some even deserve the cynical comment of a celebrated wit: "If you steal from one author, it's plagiarism; if you steal from many, it's research." Manifestly this remark is unfair to good research. It does, however, characterize certain reports that pose as research. Inquiry usually will disclose gaps in the early education of such authors.

The benefits of fundamental research, the result of private expenditure, have been so overwhelmingly demonstrated that research is now confronted with a new

problem, that of withstanding popularity. It is assumed that since the value of research to the nation has been so outstanding, more research will be still better, and the government should invest millions to supplement previous privately supplied funds and go in for the purchase of research in a big way. Varying opinions are held as to the advisability of government-subsidized research; some hold that government funds are needed to reinforce private sources now being exhausted by heavy tax burdens, and others maintain that the entry of government funds into the research field will itself discourage further contributions from private sources. But more important than these questions is that of the method of utilization of funds. Imagination and ideas cannot be grown to order; they come from unsuspected places. After the initial idea or concept is born, collateral lines of approach must be explored patiently and often without positive result. The scientific method cannot be forced, nor will the provision of funds by the officials of the state or of foundations for specific purposes of their own devising bring it forth. And so, research must be free—free from the demands of today or tomorrow. Such freedom can be best realized in universities; workers must be under no compulsion other than the inner driving force of their genius. If government funds are to be used to advantage, they should be under the direction of universities, and especially of individuals in them who have already demonstrated their ability to utilize their own funds, free from any governmental obligation or political interference, inspired only by a love of truth.

PERSONAL RESPONSIBILITY

Under recent popular political leadership now fortunately on the wane, many people, especially of the younger generation, have been led to believe that they can avoid personal effort and get help by looking to government. They have been taught to "demand their rights" with no word as to their own responsibilities as citizens. They do not realize that they and their fellow citizens are the government. Humanity demands local and state help for the unfortunate and needy; needy students also should receive help to supplement their own efforts. But they and some of their elders might well consider the fable of the frog.

A frog found himself in a deep rut in the road and made a number of unavailing hops to get out. A rabbit came by, heard the frog's story, and volunteered to get a ladder. When he came back with the ladder, he found the frog sitting on the grass beside the road and asked him how he did it. "O," said the frog, "a wagon came along and I just had to get out." Now as well as then a few good hops are preferable to waiting for someone to bring a ladder.

EDUCATION FOR CITIZENSHIP

The education of a physician should prepare him to participate with his colleagues of the other professions and with all citizens in the "general art of the free man and citizen." Some knowledge of world history, and of attempts to solve social and economic problems, will reveal the fallacies of social schemes that have followed patterns such as that of the "Utopia" of Sir Thomas More. They were inspired by a desire to correct evident social and economic difficulties or governmental abuses but failed because they violated social principles or economic laws of supply and demand, or attempted to regiment a free economy and the lives of citizens. Similar schemes under various disguises, such as economic planning, federal class subsidies, and government by administration rather than by law, have been recently current here and call for an informed leadership so that we may avoid the dangers that still threaten us. An understanding of economics will unmask the false bases of Marxian theory and reveal the inevitable ruin inherent in socialistic and communistic programs. A managed economy is the weapon of a dictator. Even a limited knowledge of the history of nations of the world will make an educated man more tolerant of religions other than his own and of national ideologies as dictated by tradition, climate, geography, natural resources, population, and food supply. He will recognize the destructive intent and effects of the atheism of Marx and communism and of the effort to regiment humanity and subject all men and women to a single pattern of existence. He will distinguish between "social change" required by higher standards of living and "socialism," which threatens the economic foundations that have made these higher standards of living possible. Despite his justifiable dissatisfaction with the course of international relations, particularly those of recent years, he will hesitate to impose an idealistic, but at present unworkable, system of world government on nations that do not understand it and do not want it. Such proposals have fostered a tendency favored also by communistic thought to decry patriotism and love of one's own homeland and assume to override desires and ideologies of other nations that may have the same patriotic impulses as does ours. Patriotism, devotion to the homeland, is a secular expression of the spiritual values of tolerant religion. They are complementary, and the one enhances the other.

Good qualified leaders in the community, the state, or the nation are scarce. We see leaders come and go. A man may possess some ability to lead his followers but lacks character, or ideals, or a knowledge of history and economics, or discrimination between the mediocre and the best; in short he lacks what Sir Richard Livingstone terms the "philosophy of the first rate." The foundation of the philosophy of the first rate and of sound leadership, whether in medicine or in universities or in other activities of citizenship, is a sound cultural education and a continuing faith in the religions of our forefathers.

In any community there are a few leaders; the rest are followers. When good leaders are not replaced by their kind, good leadership is slowed or ceases; the followers become discontented and disorganized and readily accept inferior leadership. Spiritual, social, and material retrogressions ensue. This sequence is evident in the history of nations and civilizations of the past. Signs of the same process have appeared in recent years in our own country and demand sound education to save us from pseudoliberals and from the bad leadership of a superficially informed but unintelligent intelligentsia.

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CONCLUSIONS

And so we return to the primary definition of the purposes of education. The physician should have a sound vocational training in the acquirement of which a broad general university education, or its equivalent, is fundamental. By it he will learn "how to learn" as well as "what to learn." The profession of medicine is more than a technology. In addition to technical knowledge and skill the physician needs a philosophy of the first rate—character, integrity, conscientiousness, humanity, and a love for the practice of medicine. In the cure and alleviation of the physical and mental ills of mankind, the physician requires an appreciation of the psychological, environmental, social, and economic problems, as well as the physical problems, of his patients.

The triumphs of medicine have added to the stature of the physician in his community, and with this increased influence have come added responsibilities for clear thinking and leadership, for which he must be prepared. The physician shares with those in the other professions the obligations of citizenship, obligations more binding by virtue of his professional relations to the community. In the procession of advancing civilization neither science nor humanities can march alone.

122 S. Michigan Ave. (3).

TRAINING OF RESIDENTS IN RADIOISOTOPE TECHNIQUES

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The production and availability of radioactive isotopes have presented to the medical profession many valuable agents for use in the fields of medical diagnosis, therapy, and research; however, the basic knowledge and disciplines necessary for the proper use of these substances are not familiar to the average physician. Since radioactive isotopes are potentially dangerous both to the patient and to all engaged in their preparation and administration, the problem of providing the basic knowledge, training, and experience for their safe use has been of grave concern to those charged with the responsibility of distributing the radioisotopes for medical use. Several radioisotopes are being used essentially as substitutes for x-rays and radium. Radioactive cobalt (Co^{60}) teletherapy, radioactive strontium (Sr^{90}) beta applicators, and radiogold (Au^{198}) wire are examples of these uses. The manner of use of these isotopes is similar to that of beta and gamma rays of radium and x-rays and requires very little additional knowledge for men trained in radiation therapy. Other isotopes, such as radioactive iodine (I^{131}), radioactive phosphorus (P^{32}) and radiogold (Au^{198}) colloid, which are administered internally and metabolized by the body, require new and different techniques, new ideas of dosage and dosage distribution, and the knowledge of the pharmacology, physiology, and metabolism of the particular isotope. These concepts are new and require the acquisition of new information.

I^{131}, P^{32}, and Au^{198} have already become accepted agents in medical diagnosis and therapy. Several other radioisotopes hold great promise of becoming useful routine agents in the near future. Many physicians wish to have these isotopes available for their patients. However, the dangers inherent in their use have resulted in limitation of their distribution to persons who fulfill certain criteria of training and experience. When radioactive isotopes first became available for medical use numerous specialists possessed fragmentary information and training that were valuable in the application of these radioactive sources to medical problems. Such persons included radiation physicists, biologists, physiologists, radiologists, endocrinologists, hematologists, and pathologists. The cooperative effort of such individuals resulted in the institution of radioisotope programs in many centers. The necessity for the cooperative participation of individuals in these special fields is reflected in the make-up of radioisotope committees, which are an integral part of radioisotope programs in many institutions today.

TRAINING AND EXPERIENCE FOR PRACTITIONER

How can the busy practitioner who wishes to use radioactive isotopes gain the necessary training and experience? He must learn about radioactivity and the properties of the various emissions, the theory of measuring devices, the radiological units of measurement, and the principles of radiological safety. In addition to this theoretical information, he must have practical working knowledge of the various measuring instruments, methods of assay of isotopes, methods of preparing isotopes for measurement, and information on how to practice radiological safety. Medically, he must know how to interpret the readings that his measuring instruments give him in terms of the patient and his disease, know the indications and contraindications for administering the isotopes to his patient and the biological effects to be expected from the ionizing radiation, and know how to protect himself and his technical personnel from these radiations. Ideally, this material can be obtained best by attending lectures, by reading about the theoretical aspects, by doing actual laboratory work with isotopes and the various measuring instruments, and by participating as an apprentice with another physician who is well schooled in radioisotope techniques. This preparation would require full-time schooling for a considerable length of time, which is usually impossible for the practicing physician. The courses, one month in duration, given frequently throughout the year at the Oak Ridge Institute for Nuclear Studies afford an excellent basis in the theoretical and practical aspects of the physical side of radioisotope work. The acquisition of medical expe-

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From the Section of Therapeutic Radiology, Mayo Clinic and Mayo Foundation.

Read before the meeting of the Society of Nuclear Medicine, Seattle, Wash., May 29 and 30, 1954.

rience, however, is more difficult to obtain. An ideal time for a physician to acquire the necessary training in medical radioisotope work would be in conjunction with his residency training. During this period he should be willing to spend the necessary time to receive the training and necessary fundamental knowledge and experience to serve as the basis for his later practice.

If institutions that have an active radioisotope program in operation can arrange an adequate program for residents desiring such training, a supply of physicians trained in the medical aspects of radioisotopes will become available. Several institutions have established formal programs for residency training, many others supply such training informally, and many institutions equipped to do so have not as yet set up such programs.

At the Mayo Foundation a formal training program in radioisotopes has been offered for the past 18 months to fellows in radiology. These fellows are assigned to this service full-time for a period of three months. This period seems to be fully adequate when it is considered that these radiology residents have already received much of the theoretical material in radiation physics and have obtained practical experience in the clinical effects of ionizing radiations in their work with patients receiving radium or roentgen therapy. The objectives of this training program are to present to the resident the fundamental material regarding radioactivity and the properties of radiation, to teach him how to handle radioactive materials safely, to give him practical experience with the various measuring instruments, to let him participate actively in the administration of beta and gamma ray-emitting isotopes to patients and care for these patients after administration, and to impart the philosophy regarding clinical radioisotope practice held by the staff here. For purposes of discussion the curriculum may be divided into three main categories.

THEORETICAL PRINCIPLES

The theoretical principles are presented by means of lectures, demonstrations, and reading material. The main subjects are basic mathematics, units of matter, radioactivity, physical properties of radiation, biological effects of radiation, radiological safety, theory and use of measuring instruments, radiological units—dosimetry, and tracer methodology. Most medical residents have had little background in the mathematics pertaining to radioactivity. A short, uncomplicated, practical discussion of logarithms, exponents, and necessary statistics at the outset of the period is helpful for the understanding of the material to be presented later. The slide rule is almost a necessity for isotope workers. A short demonstration of the basic manipulations for multiplication and division plus the need to use the rule in his practical work will provide the stimulus for the trainee to learn the use of this valuable aid. Discussion of the fundamental nature of matter and radioactivity at a fairly elementary level is necessary and sufficient for the needs of these men. Too complex a presentation confuses the student with too many new concepts and may result in the retention of none. The approach to the properties of radiation is coordinated with that of the biological effects of ionizing radiations and radiological safety. It is in these latter two fields that this material will be used.

Discussion of the measuring instruments is accompanied by demonstration of the instruments and their operation. The advantages and limitations of the various types of instruments are stressed. Discussion of radiological units and dosimetry includes equivalent ionization and energy absorption units; biological, effective, and physical half-life; dosimetry of beta ray emitters; and dosimetry of gamma ray emitters. Tracer methodology is largely of use in research fields outside the scope of this training. A short discussion is included to show the resident that there are pitfalls in tracer methods and certain criteria to be met in designing experiments using radioactive isotopes. In addition, knowledge of the tracer method will enable him to advise his colleagues doing research concerning precautions to be taken in the use of isotopes, the possibility of radiation effects modifying the result, and estimation of radiation dosage delivered to the experimental material.

We have found the sound motion pictures produced by the Army Signal Corps in conjunction with the isotopes division of the Atomic Energy Commission to be a useful aid in presenting much of this material. The fact density in these films is great, and to obtain the greatest benefit they must be shown more than once and in conjunction with the lectures on the subject covered. These films are available on loan from the Army or may be purchased at a reasonable rate from a commercial firm. My colleagues and I have found the following films useful: Fundamentals of Radioactivity, Properties of Radiation, Practical Procedures of Measurement, Methodology, Principles of Radiologic Safety, and Practice of Radiologic Safety.

PRACTICAL APPLICATIONS

Some of the practical procedures carried out by the residents are identification of radioisotopes, calibration and use of measuring devices, preparation of radioactive material for assay, in vivo and in vitro assay of material containing radioisotopes, autoradiographic procedures, safety procedures, survey for radiation hazards, decontamination and waste disposal, and bookkeeping. It is of utmost importance that the trainee gain as much practical experience in the various radioisotope techniques as possible. Many of the more routine procedures of counting and assay are performed in the larger centers by technical personnel. However, there is as great a shortage of these technical personnel as there is a shortage of properly trained physicians and radiation physicists. It is probable that the resident will have to supervise the training of such personnel when he institutes his own program at a later date. His effectiveness in training such personnel will be greatly enhanced if he has practical experience with such procedures himself. A considerable portion of the resident's time during the training period is devoted to such work. He performs the routine procedures in use in the laboratories aided by the technician. Other widely used or accepted procedures not part of the routine in our laboratories are performed as laboratory exercises. An attempt is made to give the resident as comprehensive a basis as possible of various assay, preparation, and counting methods and experience in their use.

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Considerable emphasis is placed on the safe handling of the various radioisotopes and the methods for achieving this. The efficiency of the various methods is brought out by exposure inventories of each step in each procedure used. When new procedures are considered, the resident helps to establish safe methods by doing radiation exposure surveys of the entire procedure. Our residents in radiology are most cooperative in the matter of radiological safety. They realize that they will be receiving exposure from fluoroscopic procedures, radium, diagnostic and therapeutic x-rays, and isotopes and are anxious to keep all such exposure to a minimum. This radiation exposure awareness among the residents has provided the stimulus for improved protection facilities and practice not only in the radioisotope work but in the other branches of radiology as well. The residents' constant evaluation and criticism of the methods in use have resulted in improvements in technique and reduction in exposure of personnel throughout the institution.

Orderly and systematically kept data are invaluable in calculations, in checking back for possible errors, and in following changes in the material being studied. The value of good bookkeeping becomes apparent to the resident as he performs his technical duties. In fact, the bookkeeping in our section has been greatly improved by the criticism and suggestions of our residents in training.

CLINICAL ASPECTS

Administration to human beings of potentially dangerous substances, whether radioactive isotopes or any other form of medicament, requires assessment of the possible benefits to be achieved against the possible damage to be encountered. In the case of radioactive isotopes, some of the potential benefits and dangers are known and some are not. Knowledge of the disease, the patient, the pros and cons of other methods of treatment, as well as the isotope method, all contribute to the decision of whether such treatment should be undertaken. Medical judgment cannot be taught. The responsibility of the preceptor is to impart as clearly as possible his reasoning in coming to his decision. The trainee then begins to form his own philosophy, based at first on that of his preceptor and on his reading and later modified as his own observations and experience are acquired.

In radioactive isotope training, just as in other training of medical residents, the ideal is to provide the trainee with the basic information, guidance, and experience so that he may draw on this material in his later practice to provide sound medical care to his patients. The trainee should consider the following clinical aspects with regard to the patient: (1) medical workup, (2) indication for the use of the isotope, (3) care after administration, and (4) evaluation of results. Regarding use of the isotope, the following aspects should be considered: (1) isotopes in general use—behavior in human beings, effects on disease processes, and limitations; (2) methods of administration; (3) survey of isotope distribution in patient; and (4) assay of isotope in excreta.

In practice the resident takes the history of the patient and examines him. He discusses the features of the case with the consultant and participates with him in the plan of treatment. He assists in the preparation, assay, and administration of the isotope and follows the patient in the postadministration period. It is our practice to assign a resident to a particular patient and to have him perform all the technical as well as medical work with that patient until the patient is dismissed. If possible he will also see the patient on follow-up visits, but, since the training period is short (three months), his follow-up experience is usually limited to seeing patients on whom other residents have worked. Weekly round-table discussions are held at which the problems presented by patients currently under observation are discussed, recent publications of interest are reviewed, and a short pertinent subject is presented.

Active clinical experience at the present time is confined to three isotopes. The residents learn the use of I^{131} for diagnostic tracer tests for thyroid function and for tracer evaluation of thyroid cancer suspects including survey and autoradiography. They learn the correct types of therapy of hyperthyroid states and of carcinoma of the thyroid, as well as therapy needed to produce myxedema in patients with extrathyroidal disease—for example, angina pectoris or pulmonary emphysema. They receive training in the use of P^{32} for treatment of polycythemia vera and for treatment of chronic leukemias. They learn the use of Au^{198} colloid for treatment of pleural and peritoneal malignant lesions.

During the three month period sufficient experience is usually accumulated in most of the foregoing categories. Therapy of thyroid cancer is an exception. There are very few patients with cancer of the thyroid who are suitable for a full-scale treatment program with I^{131}. In addition, the administration of such treatment may run into a period of several years. In such a situation the records of all patients in our series are carefully reviewed with the residents to give them an idea of how such treatment is carried out and the results achieved to date. In addition to the foregoing isotopes, both clinical and research work is being done using other isotopes. The residents are made aware of such work and urged to follow its progress to be aware of the scope, usefulness, and applications of these isotopes as a research tool. Should the resident desire to carry out a research project himself, facilities are available for such work. This, of course, requires the expenditure of more time than is allotted to the radioisotope training period. In the past, I think that the residents who have performed such projects have received more benefits from the increased time expenditure than has been lost by the forced neglect of other aspects of their training.

COMMENT

Clinical use of radioactive isotopes is rapidly changing and progressing. In the design of a training program, it is impossible to anticipate many of the possible uses to which radioisotopes may be put in the future. The purpose of the program outlined is to provide the trainee with the background and experience so that he may participate intelligently in the future development of this phase of medical practiee. At the present time it seems necessary for residents to devote considerable time to such a training program. This is because of the introduction of many new disciplines and concepts to which they have not been exposed previously. However,

the youth of today in grade school and college have knowledge of such things as Geiger counters, gamma rays, neutrons, and the like. Medical students are taught about the use of radioisotopes as routine research tools and as medical diagnostic and therapeutic agents. The residents of the future should have a much more comprehensive idea of these subjects, and the need for spending considerable time on the fundamentals will be gone. When that time comes, the radioisotopes will take their rightful (and less glamorous) place as routine agents of the physician.

200 First St. S.W.

THE PHYSICIAN'S RESPONSIBILITY TO MEDICAL ORGANIZATIONS

Everett C. Fox, M.D., Dallas, Texas

Hippocrates, the "father of medicine," is remembered in history not only for his contributions to medicine but also for his code of ethics and lofty ideals. Historically and traditionally, the physician has been dedicated to the service of his patients and has been a respected member of the community. The duties of a physician were quite simple: He took care of his patients as best he could. But in recent years, this has been changed for our generation of physicians and probably for future generations. We still assume our principal duties of the care of the ill but have been forced out of our traditional orbits into many spheres of activity. It has become necessary for us to become better informed and to exert a wholesome and constructive influence upon the economic, social, and political affairs of our community, state, and nation.

BROADER RESPONSIBILITIES TODAY

These necessary activities take much of the time and energy that the physician might devote to his patients. The physician of today has a great responsibility to his profession and should participate actively in the functions of his county, state, and national medical associations. Today, a physician must be well informed about medical, scientific, economic, social, and political problems and should be able to discuss them intelligently and articulately. He must devote considerable time to the duties of the committees of his county and state medical associations, to his hospital staff, community agencies, service clubs, and other organizations. I do not need to mention how arduous these tasks may at times become. Effective work on medical society committees such as voluntary health insurance, emergency call service, mediation, physician placement, public relations, and veterans' affairs may determine if your patients will receive as good medical care in the future as they have in the past. These new activities are part of our duty and responsibility to our patients. If we cannot keep medicine free, the ultimate losers will be our patients. We must lend every support to our voluntary hospital system, serve willingly and diligently on staff committees, and assist in the instruction of the intern and resident staffs and the nursing personnel.

The county and state medical associations have rendered great service in the study of these problems and have furnished many satisfactory and acceptable answers to the numerous issues confronting us. But the great burden of the study of many of the scientific, economic, and political problems must be at the national level. Only a few of us have recognized the importance and effectiveness of the many activities of the American Medical Association.

FUNCTIONS OF THE AMERICAN MEDICAL ASSOCIATION

The American Medical Association, through its Board of Trustees, the House of Delegates, and its various councils and committees, has rendered a great public service to the American people by its constant alertness to the political and scientific problems presented and by its recommendation of sound, fair solutions for the welfare of the public, the advancement of scientific medicine, and the betterment of the public health. The A. M. A. represents more than 150,000 physicians from 53 states and territories and 2,000 county and district medical societies. The annual budget is over 9 million dollars, 60% of which is received from dues and subscriptions to THE JOURNAL. More than 5 million dollars is expended on scientific activities and over 2 million on public information and socioeconomic activities. The 190 members of the House of Delegates elected by the states, territories, and sections determine, activate, and supervise the policies of the A. M. A. They are the legislative body for the American physician.

Scientific Activities.—The major emphasis of the A. M. A. is upon scientific activities that are largely conducted by the Council on Scientific Assembly with its 21 sections, the Bureau of Exhibits, the Council on Medical Education and Hospitals, the Council on Mental Health, the Council on Industrial Health, and the Division of Therapy and Research, which includes the Council on Pharmacy and Chemistry, the Council on Physical Medicine and Rehabilitation, the Council on Foods and Nutrition, the several standing committees of these councils, the Committee on Cosmetics, the Bureau of Investigation, and the chemical and physical laboratories. The work of these councils is especially important in advancing the science of medicine. The outstanding reputation of the council members for specialized scientific knowledge and integrity is well recognized. They serve without remuneration and render unbiased decisions based on careful considerations of all available scientific evidence and expert opinion.

Socioeconomic Activities.—Every physician today must concern himself with the social and economic aspects of the practice of medicine as it reflects on the patient, the public, and the profession. The A. M. A. acts collectively for the individual physician in the socioeco-

Chairman's address, read before the Section on Dermatology and Syphilology, at the 104th Annual Meeting of the American Medical Association, Atlantic City, June 8, 1955.

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nomic field, which includes ethics, laws and legislation, medical service, economic research, rural health, and health education. The activities in these fields are carried out by the Council on Medical Service and its seven special committees that deal with medical care for industrial workers, relations with lay-sponsored voluntary health plans, prepayment hospital and medical service, extension of hospitals and other facilities, indigent medical care, federal medical services, and maternal and child care. The Council on Medical Service studies the social and economic changes in the practice of medicine and reports these changes, conducts surveys, and acts as an information center for the profession and the public. The Council on National Defense, the Council on Rural Health, the Judicial Council, the Bureau of Medical Economic Research, the Bureau of Health Education, the Committee on Legislation, the Law Department, the Department of Public Relations, and the Washington Office provide information for physicians and allied health agencies.

Publications and Related Activities.—The third important activity is the scientific publications. THE JOURNAL of the American Medical Association, established in 1883, publishes 165,000 copies weekly and is the most valuable medical publication in the world today. There are also nine special A. M. A. journals, including the *A. M. A. Archives of Dermatology*. In addition, the A. M. A. publishes the Quarterly Cumulative Index Medicus, the Standard Nomenclature of Diseases and Operations, New and Nonofficial Remedies, *Today's Health*, and the American Medical Directory.

Important related activities include the Women's Auxiliary, the Student American Medical Association, and the American Medical Education Foundation. More physicians should become financially acquainted with the last organization. Someone provides approximately $10,000 above the cost of each doctor's medical education. Physicians are now asked to return at least $100 annually, individually, to help provide for the financial support of the medical schools. The above lists of councils, committees, the House of Delegates, the officers, and the Board of Trustees of the A. M. A. represent about 500 physicians. These men are doing much of the effective work, study, and evaluation necessary to determine the policies, programs, services, and accomplishments of American medicine. They are dedicated to the purpose of the promotion of the science and art of medicine and of providing better medical care for the American people. They are elected representatives from state societies and scientific sections. Many other physicians have helped in the advancement of scientific medicine by developing our many special societies, colleges, and academies and by organizing and supervising specialty boards.

VOLUNTARY HEALTH INSURANCE

As physicians, we must accept our scientific and economic obligations to medicine, to medical education, and for the improvement of the medical care of our patients. We should give assistance to the development of the voluntary health insurance plans that now protect 100 million people from the major costs of illness, a cooperative effort of hospitals, insurance underwriters, and physicians in every state of the nation. Recent surveys reported to the American Hospital Association showed that, in 1940, 60% of the population favored government compulsory health insurance, while recent polls show this figure has decreased to 19%. Doubtless the effectiveness of the voluntary health insurance plans has strongly influenced this trend. This change of opinion occurred during an era when government was spending millions on propaganda for socialization. Since 1900, during part of this same period, scientific advances have increased life expectancy 20 years. We all realize that the cost of medical care has increased during a period of inflation, development of new drugs, increased usage of medical care, and increased demands for hospitalization. However, the U. S. Bureau of Labor Statistics shows that the consumer price index was 92% higher in 1954 than in 1935-1939, but medical care costs rose only 74% and physicians' fees only 60%. Private expenditures for medical care totaled 9.9 billion dollars in 1953, a 37% increase over 1948 according to reports by the Social Security Administration. In the five year period, voluntary health insurance benefits increased by 217% to 1.9 billion dollars and met 20% of the total medical bill, compared with 8.4% in 1948. Hospital insurance benefits were 455 million dollars in 1948 and 1.28 billion dollars in 1953; benefits for physicians' services were 151 million dollars in 1948 and 632 million dollars in 1953. The physician's portion of the medical care dollar has actually decreased since 1950.

Provision by the Veterans Administration for the care of veterans with non-service-connected illnesses, who utilize 85% of all VA beds, must have a better understanding by the public, service organizations, and the profession. The veteran with service-connected disabilities should have more and better medical care and more realistic disability payments for wartime injuries. Veterans with non-service-connected disabilities should provide their own medical care when financially able, as do other citizens, and should be a community responsibility when indigent. Social security as it affects the American people and the physician requires evaluation. Social security is a system that is neither social nor secure; advocated as insurance and as actuarially sound, social security is really a system of taxation and socialization. A system that pays $48 for one dollar of an individual's tax cannot be financially sound. Social security is not insurance; its benefits are federal gratuities paid from taxes. These and many other problems face the medical profession and the American public they serve. Physicians should be familiar with these problems and the effective policies developed for their solution.

LOCAL RESPONSIBILITIES

The physician should participate actively in his county medical society's program. He should be happy to give his time and skill to indigent medical care services. The physician's responsibility and opportunity as a citizen is important to every community. Individually and collectively, physicians are responsible for adequate medical care. They should use their ability in the development of community plans for adequate medical care. They must

direct more attention to the social and economic relationships of medicine to society. A physician should have a community interest in and help develop churches, schools, chambers of commerce, health councils, and service clubs. The influence of the physician in his own community is enhanced by his interest and participation in community projects. Although he is a physician, he is also a citizen with the rights, obligations, and responsibilities of a citizen, and those rights, obligations, and responsibilities should be exercised. It is a civic duty to participate in the affairs of government.

THREAT OF SOCIALIZED MEDICINE

The suggestions presented today may require much additional time and work by many physicians. This extra time will still be devoted to patients through these social and economic activities. It is for our patients, the American public, that these tasks must be accomplished. They are the ones who will suffer the greatest if their freedom in medical care is jeopardized. The physician's basic and traditional responsibility to his patient will be advanced and maintained. The attempts to socialize medical care indicate the trend of many of our governmental agencies. The medical profession was merely the first section of the economy to come under the socialist's attack. If these measures are not resisted, they will involve industry, finance, insurance, transportation, agriculture, and education, as well as medicine.

The medical profession, through its medical organizations and with the aid of an aroused and informed public, refused to accept compulsory health insurance. If the recent trends of our national government are not changed and its paternalism, bureaucratic socialism, and one-world nationalism not restrained, all of our freedoms given by the Constitution and under the Bill of Rights will disappear. We should understand the social and economic conditions confronting us. The physician should develop a wholesome and constructive influence upon the medical, social, economic, and political affairs of his community, state, and nation.

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ESTROGEN GIVEN PARENTERALLY TO CONTROL EPISTAXIS AND HEMORRHAGE AFTER ADENOIDECTOMY

PRELIMINARY REPORT

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The control of spontaneous bleeding is a problem familiar to all physicians. In rhinolaryngology epistaxis and hemorrhage following tonsillectomy and adenoidectomy are the two most common examples of this problem. The term "spontaneous hemorrhage" is used to define marked, sudden, and unexpected bleeding.[1] It does not imply that the hemorrhage is idiopathic, although the cause may not be determinable. Nor as it is used here does it refer to bleeding resulting from the rupture of a single vessel but connotes profuse oozing from the surface of the bleeding area, wherever it might be. Finding a simple, reliable solution for these common emergencies has taxed the ingenuity of the medical profession. To control spontaneous epistaxis, many schemes of therapy have been recommended, such as vitamins K and C, anterior and posterior nasal packing, penicillin, cautery, ice packs, thrombin and fibrin foam, and ligation of the external carotid artery.[2] In certain cases, one method or a combination of these treatments is successful. Other cases resist any attempted therapy and stop as enigmatically as they begin, leaving the patient in an exsanguinated condition and in rare cases even proving to be fatal. Immediately following adenoidectomy, spontaneous oozing, if recognized, usually can be controlled with packing.[3] In an occasional case this treatment is not effective; in many it is a difficult and complicated procedure; in all it is time consuming. The purpose of this article is to offer a relatively new approach to these problems. On the basis of the results in the series to date, it is felt that the use of parenterally given estrogen is the treatment of choice in spontaneous epistaxis and hemorrhage following adenoidectomy. This study was prompted by the work of Jacobson, who reported successful treatment of over 300 cases of spontaneous epistaxis with parenterally given estrogen.[4]

REPORT OF A CASE

In the study reported here the method was first tried on a 26-year-old male who presented himself in the emergency room of the hospital with the chief complaint of epistaxis of three days' duration. The bleeding had started spontaneously and resisted all attempts to control it at other hospitals and clinics. As the patient was in an obvious state of exhaustion and exsanguination, he was admitted and received a transfusion of 1,000 cc. of blood. The nose was packed anteriorly and posteriorly, and supportive therapy with vitamin K, vitamin C, Koagamin (aqueous solution of oxalic and malonic acids), penicillin, and ice packs was instituted. The profuse bleeding was stopped, but oozing continued. On the second and third hospital days it was necessary to change the anterior packing. On the fourth day after admission, because the patient was complaining bitterly about the posterior packing and there was evidence of slight ulceration of the soft palate, the packs were taken out. There was no bleeding for two hours; then the patient began to hemorrhage profusely from the nose and mouth. At this time 20 mg. of conjugated estrogens equine was administered intravenously. The bleeding stopped within one hour. Three days later a slight oozing began; again 20 mg. of estrogen was given

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The conjugated estrogenic substance, used in this study as Premarin, was supplied by Ayerst Laboratories, Inc., New York.

1. Jacobson, P.: A Unified Concept of "Spontaneous Bleeding," Current M. Digest **21**: 30 (Nov.) 1954.

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3. Lederer, F. L.: Diseases of the Ear, Nose, and Throat, ed. 6, Philadelphia, F. A. Davis Company, 1952, p. 743.

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intravenously. In a half hour the bleeding stopped. Within a few days the patient was discharged from the hospital; there has been no more bleeding. Because of the blood picture the possibility of the patient's having an early leukemia was considered, but this diagnosis could not be substantiated. The etiology of the spontaneous epistaxis has not been determined.

EPISTAXIS

Nose bleeds may be primary or secondary, may be induced or spontaneous, or may or may not be pathognomonic. In the majority of patients they will stop spontaneously. This fact must be considered not only in treating patients but also in evaluating any type of therapy. In some cases a small ruptured vessel can be found; these cases are usually minor and are easily controlled. However, in the more serious cases, and in all cases of spontaneous hemorrhage, there is profuse bleeding from many vessels in the nasal mucosa. Like streams swelled by a sudden rainstorm, the vessels of the mucosa seem to overflow. As the bleeding stops, there is a recession and the vascular system of the nasal mucosa reverts to its normal condition with no evidence of the previous disturbance. The primary etiology of these hemorrhages is usually difficult to diagnose, and when a patient presents himself in such a condition the primary problem is to control the bleeding. Once this is accomplished, every effort should be made to determine the cause.

Since the initial case, five more have been treated and controlled with intravenously given estrogen. Although in none of them was the bleeding as prolonged and as profuse as in the original case, the epistaxis in each gave the clinical impression that it would be very difficult to control with the usual therapy. Any case of epistaxis in which no bleeding point can be found, in which the bleeding is coming from the nasopharyngeal area, or in which the bleeding has been continuous for several hours demands active attention and therapy. Each of the cases in this study fills these criteria. The therapy was 20 mg. of intravenously administered estrogen. Table 1 summarizes the data. In cases 3 and 6, the epistaxis was associated with hypertension. In case 5 profuse bleeding was provoked by removing the petroleum jelly gauze packing, which had been inserted after the submucous resection. Four patients were treated in the office, one was admitted to the hospital because of exsanguination, and the other was hospitalized because of a history of hypertension with hemorrhage. All six cases have been closely followed, and in no case has there been a recurrence of bleeding.

HEMORRHAGE FOLLOWING ADENOIDECTOMY

Because of the similarity of the bleeding in epistaxis and the profuse oozing from the operative site that occurs in some patients after adenoidectomy, it was decided to evaluate the parenteral route of administration of estrogen in these cases. This type of bleeding at times may be difficult to control, and deaths have been reported from it. The advisability of classifying hemorrhage after a surgical procedure as spontaneous may be questioned; however, it is felt justified in this instance because the two most important factors contributing to bleeding after adenoidectomy were eliminated. First, the operation was done under direct vision with a palate retractor, and all visible adenoid tissue was removed; second, the patient was kept under anesthesia as short a while as possible. Open-drop administration of ether was used because as quick a recovery as feasible was desirable to remove the likelihood of occult bleeding that might not be discovered until the patient was in a critical condition. With the elimination of these two important factors, residual adenoid tissue and prolonged recovery, any bleeding was attributed to diffuse oozing from the vessels in the palatine mucosa.

The series reported on in table 2 contains 10 cases of young children who within six hours after completion of the operation developed significant bleeding from the operative site. A small amount of bleeding is not unusual after adenoidectomy. These patients, however, were bleeding profusely. The bleeding and coagulation times in all patients were within normal limits. Because of technical considerations it was decided to give the estrogen in these cases intramuscularly. Depending on the weight of the child, either 5 or 10 mg. was the selected dose, which was given deep into the gluteal mus-

TABLE 1.—*Case Histories of Six Patients with Epistaxis*

Case No.	Age, Yr.	Sex	Duration of Bleeding, Hr.	Pertinent History	Possible Cause	Treatment	Time Lapse Between Estrogen Therapy and Control, Min.	Follow-Up, Time with No Recurrence
1	26	M	72	Admitted to hospital	None known	4,000 cc. blood; 3,000 cc. glucose; coagulants; anterior and posterior nasal packing; Premarin * intravenously	60	3 mo.
2	55	M	4	Treated in office	None known	Premarin intravenously	30	4 wk.
3	47	M	3	Blood pressure 195/100 mm. Hg; treated in office	Hypertension	Premarin intravenously	20	3 wk.
4	74	F	12	Treated in office	None known	Oxidized cellulose (Oxycel) packing; Premarin intravenously	30	4 wk.
5	30	M	..	Submucous resection 2 days prior	Removal of petroleum jelly gauze packing	Premarin intravenously	30	3 wk.
6	57	M	4	Blood pressure 190/110 mm. Hg; admitted to hospital	Hypertension	Anterior and posterior nasal packing; Premarin intravenously	180	3 wk.

* Premarin is a conjugated estrogenic substance.

cle. Table 2 summarizes the case histories. Each patient was checked every 10 to 15 minutes after the administration of the estrogen to determine when the bleeding had stopped. With the exception of one case that was not completely controlled until two hours after therapy, the bleeding stopped within one hour. The uniformity of the results and the quick response rule out the possibility of coincidence and definitely demonstrate the value of parenterally administered estrogen.

COMMENT

Why the parenteral administration of estrogen stops spontaneous hemorrhage in cases of epistaxis and bleeding following adenoidectomy is not known. At the present time it is empirical therapy. Estrogen in the management of cases of spontaneous hemorrhage was first used in the treatment of functional uterine bleeding. The female hormone appears to support the vascular integrity of the blood vessels of the endometrium. When the blood level of estrogen is markedly decreased, these blood vessels tend to rupture and bleed. The administration of estrogen stops the bleeding, probably through a reversal of this phenomenon. Estrogen may have a similar effect on other blood vessels in the body and in this manner control bleeding from other sites. A second explanation may be a beneficial effect of estrogen on the clotting mechanism of the body. Working through an enzyme system, it may either speed up the clotting process or provide some missing factor. Parenterally given estrogen has been shown to lower abnormal bleeding times in newborn infants.[5] A third explanation is the possibility that estrogen stimulates the release of thrombocytes into the blood stream. This was suggested by the blood picture of the initial case in this series. On the day before estrogen was given parenterally, the thrombocyte count was 180,000 per cubic millimeter; on the day after, the thrombocyte count was 340,000 per cubic millimeter. The possibility that this increase in platelets was produced by the blood transfusion given in the interim between the two counts was considered. But when the red blood cell counts on these two days were compared, it was noted that on the day prior to the therapy the red blood cell count was 3,150,000 per cubic millimeter; on the day after, 3,250,000 per cubic millimeter. There was, then, obviously a relative increase in the thrombocyte count. The possibility of such a property of estrogen should be considered; however, this finding in just one case is only suggestive and in no way offers proof.

TABLE 2.—*Hemorrhage Following Adenoidectomy*

Case No.	Age, Yr.	Sex	Post-operative Time of Onset, Hr.	Dose of Parenterally Given Estrogen, Mg.	Time Lapse Between Therapy and Cessation of Bleeding, Hr.
7	3	M	3	5	¾
8	6	F	4	10	1
9	5	M	5	10	½
10	7	F	1	10	½
11	7	F	4	10	1
12	4	M	3	10	1
13	6	M	3	10	1
14	5	F	2	10	1
15	4	M	6	5	1
16	6	M	¾	10	2

The significance of determining a simple reliable method of controlling spontaneous bleeding in epistaxis and hemorrhage following adenoidectomy is obvious. These two emergencies are important contributors to the rates of morbidity, and even mortality, in otorhinolaryngology. Furthermore, the strong possibility that the parenteral administration of estrogen may prove to be an important factor in control of other sites of spontaneous hemorrhage must be entertained. Value of parenterally given estrogen in managing cases due to one determinable bleeding point is not within the scope of this study. A comparison of the cases of epistaxis, in which the estrogen was given intravenously, and the cases of hemorrhage following adenoidectomy, in which estrogen was given intramuscularly, shows that the time interval was relatively the same. In no case were there any side-effects from the therapy. The results of the study were extremely gratifying. In no instance was their failure. Furthermore, the uniformity of the response rules out the possibility of coincidence and offers important evidence that parenterally given estrogen in some manner controls spontaneous bleeding. The evidence offered by this series of cases is too small to be considered conclusive. However, the fact that the parenteral administration of estrogen effectively controlled 6 cases of profuse epistaxis and 10 cases of severe, spontaneous hemorrhage after adenoidectomy is of extreme importance. It is hoped that future work with larger series of cases and more varied problems will substantiate the results of this series.

SUMMARY

Sixteen cases of spontaneous epistaxis and hemorrhage following adenoidectomy were treated with parenterally administered estrogen. The response in all cases was dramatic, and in only three cases was the length of time between the administration of the medicament and the cessation of bleeding over one hour. The consistency and rapidity of response rule out the possibility of automatic cessation and coincidence. Three possible mechanisms of action of estrogen are considered, but besides the passing evidence that estrogen may stimulate the release of thrombocytes, this study does not contribute any information toward the solution of the enigma. Even though the therapy at the present must be considered empirical, the effectiveness of parenterally given estrogen and the control of spontaneous epistaxis and bleeding following adenoidectomy offer strong evidence that merits serious consideration. It is hoped that future studies will not only confirm this series but also demonstrate the value of this therapy for other types of spontaneous hemorrhages.

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LUMBAR TRACTION THERAPY—ELIMINATION OF PHYSICAL FACTORS THAT PREVENT LUMBAR STRETCH

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Traction is a widely employed procedure in low back and/or sciatic pain, particularly in the conservative treatment of herniated intervertebral disks. The method usually consists of weight applied to a pelvic belt or to the lower extremities, with an average of 10 to 15 lb. on each side, usually a maximum total of 30 lb. This weight is completely neutralized or dissipated as a stretch force because of surface traction resistance of the lower body segments. These findings negate the concept that this method of traction therapy is of any value as a lumbar stretch force or that it is of any value as a stretch force in "overcoming muscle spasm" of the lumbar spine. Its chief virtue, apparently, is to confine the patient to bed. In a recent report,[1] physical evidence was presented to demonstrate that, when hanging weight traction is applied to the lower body segment, pull or stretch force does not reach the lumbar spine and its surrounding tissues and that this method is of no value as a longitudinal stretch force to the lumbar spine. This report deals with the physical aspects of lumbar traction, and no attempt is made to evaluate the effect of such therapy.

ASCENDING FORCE DISSIPATION

When traction is applied to the lower extremities, the weight required to apply stretch will vary according to the level at which stretch force is desired. The higher the segment in which stretch force is desired, the more weight will be necessary. Traction loses its effect as upper levels of body segments are reached. For example, 5 lb. would cause a stretch in the ankle but little in the knee and 10 lb. of traction would cause a stretch at the knee but little at the hip. Fifteen pounds may provide some stretch at the hip joint but none in the lumbar spine. This progressive requirement of increased traction force as upper segments are reached is due to surface traction resistance of the combined lower segments. Important factors that create and modify surface traction resistance are: (1) the area of surface contact of the body or body segments; (2) the weight of the body or body segments; and (3) the quality, contour, and texture of the contacting surfaces. In lumbar traction, surface traction resistance may be defined as the horizontal dragging force necessary to overcome these combined factors. All applied weight that does not exceed the surface traction resistance of segments below the lumbar spine is without lumbar stretch effect. After these resistance factors are overcome, only adequate additional weight will have a stretch effect upon the lumbar spine.

STUDIES AND OBSERVATIONS

In order to determine the surface traction resistance of the body and its segments, a cadaver and three live subjects were studied. The details of this study have been previously described.[1] Under uniform conditions weight was applied until it exceeded the surface traction resistance of the body, the excess weight being recorded upon a scale and head-halter attached to the head of the bed. The cadaver was then sectioned transversely through L3–L4 interspace. Leg and pelvic traction was again applied and recorded. Both hip joints were disarticulated, and surface resistance of the lower extremities and pelvis were measured. The knee joints were disarticulated, and traction resistance of the lower segments were measured. In the cervical spine it can readily be observed that no stretch will take place with 5 lb. of hanging weight. Actual figure was 6 lb. of dissipated force.

The forces necessary to overcome surface traction resistance, under the conditions described, whether it be the whole body, cadaver or living subject, or body segments, are approximately the same—they average 54% of the weight. Tone and elasticity of tissues appear to have no practical bearing upon the required force. The lower body segment (L3–L4 interspace) composes almost half (49%) of the entire body weight. Since the lower body segment is almost half the body weight and requires 54% of its weight to overcome its own resistance, 26% of the entire body weight is calculated as an approximate average figure for the force necessary to overcome the lower segment resistance. The 26% of the total body weight that is required to overcome the surface resistance of the lower body segment is designated as the dissipated force factor. This force is completely neutralized and lost as a stretch force to the lumbar spine. The only traction force that could have any lumbar stretch effect is that which exceeds the amount needed to overcome the surface traction resistance of this segment. The force required with pelvic traction is the same as that with Buck's extension. In one instance the lower body segment is being pushed and in the other being pulled to the foot of the bed. The Trendelenburg position with a 6-in. elevation of the foot of the bed yielded only a 5% increase in countertraction. This increase in countertraction produced by the Trendelenburg position is not worthwhile in view of the resultant dependent headache and the anxiety produced by unnatural position for prolonged periods. When sufficient weight is applied to cause the body to shift slightly toward the foot of the bed, an illusion of end-point weight is created. This is due, however, to the shearing deformity of the mattress. With a resilient sponge rubber mattress, this will occur with much less weight.

From the Pain Section, Department of Neurology, Graduate School of Medicine, University of Pennsylvania.

Dr. L. Richard Schumacher assisted in this study.

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2. Judovich, B. D.: Herniated Cervical Disc: New Form of Traction Therapy, Am. J. Surg. **84**: 646-656 (Dec.) 1952. Judovich, B. D., and Bates, W.: Pain Syndromes: Diagnosis and Treatment, ed. 4, Philadelphia, F. A. Davis Company, 1953. Shenkin, H. A.: Motorized Intermittent Traction for Treatment of Herniated Cervical Disk, J. A. M. A. **156**: 1067-1070 (Nov. 13) 1954.

The therapeutic results of lumbar traction have not been nearly as dramatic and satisfactory as those often obtained with heavy cervical traction.[2] This can be partially explained by the lighter structures of the cervical spine, the satisfactory countertraction of the body weight, and the smaller loss due to surface traction resistance. In the past, it had been my practice to administer an average of 60 to 80 lb. of pelvic traction, using a motorized intermittent traction apparatus. Present findings reveal that in the average patient, the first 40 to 45 lb. were being lost as a lumbar stretch force, so that actually only 20 to 40 lb. of traction were obtained. This amount, although sufficient for the cervical spine, would appear to be inadequate for the lumbar spine with its comparatively dense structures.

ELIMINATING RESISTANCE OF THE LOWER BODY SEGMENT

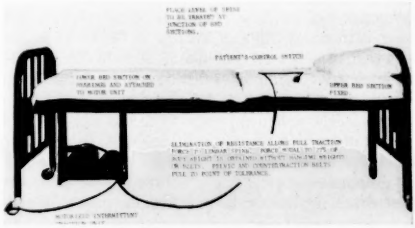
Lower body segment resistance can be totally eliminated in the following manner. A bed is built in two sections: the upper is fixed and the lower is mobile upon roller bearings and is transported by a motorized intermittent traction unit (see figure). Each section has its mattress. With the sections closed, the patient is placed supine upon the bed, with the lower spine at the junction of the sections. The resistance of the lower body is no longer a factor since it is transported mechanically. The force exerted at the lower spine is equivalent to the countertraction value of the upper body segment. This is approximateiy 27 to 28% of the total body weight (54% of 49% of total body weight). This entire force is exerted at the bed split and is obtained merely by lying upon the bed without weight or belts. Should greater traction force be desired a pelvic belt is attached to the lower edge of the moving section, and a countertraction belt is attached to the upper bedposts. In this manner unlimited traction force can be obtained. Hanging weight traction without the use of a motorized mechanism can be obtained with only a loss of 2 or 3 lb.

Body and Body Segment Weights

Segment	Weight Lb.	(Kg.)	%
Whole body	118	(53.5)	100
Lower body segment (L3-L4)	58	(26.3)	49.2
Pelvis	25	(11.3)	21.2
Lower extremities (hip disarticulation)	16.5	(7.5)	13.9
Thigh	10	(4.5)	8.5
Leg and foot (knee disarticulation)	6.5	(2.9)	5.5
Head and neck (C6-C7)	10	(4.5)	8.5

SUMMARY

Live subject and cadaver studies reveal that the average surface traction resistance of the body in a hospital bed is approximately 54% of the total body weight. The lower body segment (transverse section through L3–L4 interspace) weighs approximately 49% of the total body weight. It also requires approximately 54% of the weight of the lower body segment to overcome its own surface traction resistance. This is equal to approximately 26% of the total body weight. The force, therefore, that is dissipated with leg or pelvic traction is approximately 26% of the entire body weight. Only adequate weight in excess of this amount has a stretch effect upon the lumbar spine. There is progressively increased force dissipation ascending to higher body segments. Present methods of constant weight traction therapy to the lumbar spine are by far inadequate and produce no stretch effect upon the lumbar spine or its surrounding tissue. This is due to the fact that insufficient pull is applied to overcome the surface traction resistance of the lower body segment. The concept that hanging weight traction to the legs or pelvis provides stretch, or that it overcomes lumbar muscle spasm by such stretch, is, in view of the physical findings presented, without foundation. A method I have devised for overcoming surface traction resistance of body segments allows minimal weight to produce stretch at desired body levels. No attempt has been made at this time to evaluate the effect of traction therapy upon the lumbar spine.



Bed for eliminating resistance of lower body segment.

2006 Delancey Pl. (3).

Gangrene Following Intravenous Therapy.—Apparently neonatal spontaneous gangrene is especially referable to long and difficult labor. All cases of infant gangrene appear to be associated with infection. . . . Particular care should be given to those infants with severe general sepsis, cachexia, and poor tissue nutrition. Lowered resistance in infections is undoubtedly one cause of poor vasomotor response in infants and contributes to ultimate local tissue death even when the outcome is not fatal to the child. Every aseptic safeguard should be exerted against inviting local infection by careless procedure and thus overburdening the already critically ill infant. Careful handling of tissues for venipuncture is necessary, and especially for incision over a vein, which is imperative not only to prevent infection but to prevent accidental severance of an artery. The vessels should be exposed meticulously, with gentle introduction of the needle or polyethylene tube. . . . Before intravenous therapy is instituted for the sick infant, one should weigh the status of the cardiovascular system and proceed cautiously in the face of any observable signs or deducible implications of circulatory disturbance or inadequacy; for example, the age of the child is indicative, for the younger the sick infant the greater the hazards of emboli or thrombosis. Vasomotor instability of the tissues invites infection, gangrene, and death of tissues or even of the child. Both dehydration and overhydration are dangerous. Of the two . . . overhydration is the greater danger.—D. S. Miller, M.D., Ph.D., and R. Sébeck, M.D., Gangrene of the Extremities in Infants Subsequent to Intravenous Therapy, *A. M. A. American Journal of Diseases of Children*, August, 1955.

TWENTY-FOUR HOUR MEDICAL ANESTHESIA COVERAGE FOR OBSTETRIC PATIENTS

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and
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During the past two decades there has been a greater appreciation of the importance of good obstetric anesthesia by most physicians who care for parturient women.[1] It is now fully realized that if maternal and fetal mortality and morbidity are to be reduced further, it is essential that women in labor receive the best service that modern anesthesiology is capable of supplying.[1e] Certainly there is no justification for the misconception that obstetric anesthesia is a relatively simple procedure that requires less skill than the administration of surgical anesthesia. On the other hand, there is a great deal of evidence to indicate that the administration of anesthesia for obstetric procedures is often more complex and requires more skill than do many surgical operations.[2] In addition to the fact that two lives are involved instead of one, it is necessary to consider that special mechanical and physiological problems of pregnancy reduce the flexibility and margin of safety in the choice and use of certain methods of anesthesia. Moreover, women in labor frequently cannot be prepared properly and consequently present the additional hazard of aspiration of gastrointestinal contents. Medical complications such as the toxemias, as well as the irregular fashion in which these patients receive medication, constitute additional problems that often tax the efficiency of the obstetric team and that justify the thesis that obstetric anesthesia deserves the interest of the expert anesthesiologist.

Unfortunately, all too frequently this phase of medical practice is relegated to someone who is relatively inexperienced or who has only a casual interest in this field. It has long been the custom to assign the least experienced anesthetist and the oldest anesthetic apparatus to the delivery room. In some instances, interns and residents in obstetrics and even an obstetric nurse without any training in anesthesiology are requested to administer the anesthetic. Investigation reveals that in many institutions obstetric anesthesia remains an unwanted and, therefore, a neglected portion of the broad fields of anesthesiology.[3] Some of the best hospitals in this country provide their parturients with a quality of anesthetic service that would never be tolerated in their operating rooms.

There are several reasons for this state of affairs, not the least important of which is the fact that until recently there has been a general scarcity of trained anesthesiologists. Moreover, the lack of interest demonstrated by some teachers has caused many anesthesiologists to finish their training with a passive attitude and with a notable lack of interest toward this phase of anesthesiology. Some anesthesiologists in private practice, while admitting the importance of obstetric anesthesia, avoid as much as they can this important responsibility. They justify this attitude by pointing out that because of its emergency and unpredictable nature obstetric anesthesia encroaches unduly upon the time of the anesthesiologist and interferes with his surgical anesthesia practice. It is argued that it is physically unfeasible to give complete anesthesia coverage to the obstetric department and still run an active surgical schedule. A further pertinent reason given for the depreciation of the importance of obstetric anesthesia is that the financial remunerations frequently are not commensurate with the services rendered.

It is the purpose of this paper to demonstrate that it is feasible in every respect to provide a 24-hour medical anesthesia service to obstetric patients by describing the organization, development, and functioning of a particular group that practices in a 215-bed private hospital wherein approximately 2,500 deliveries are performed each year. In discussing the organization and development of this phase of our practice, mention will be made of the factors that are important in making such services not only feasible but also practical and that work to the best advantage of all concerned.

PLAN OF ORGANIZATION AND FUNCTION

In order to provide a proper perspective of this subject, it is necessary to describe briefly the plan of organization and function of a group of anesthesiologists that provides service not only to the hospital under discussion but to several other institutions in Tacoma. This group had its inception in January, 1952, when one of us (J. J. B.) resigned as a hospital-employed anesthesiologist and entered private practice. During the ensuing four years there has been an evolutionary growth of the group. For several months after its inception we continued to rely on nurse anesthetists to provide the majority of the obstetric anesthesia. As the demand for medical anesthesiologists became progressively greater, technicians were replaced by physicians who had completed their training or were in the process of doing so. This trend was promoted and encouraged because it was believed that in order to discharge properly all of the duties and obligations associated with the anesthetic management of obstetric patients, it is necessary to have

From the Department of Anesthesiology, Tacoma General Hospital. Read before the Section on Anesthesiology at the 104th Annual Meeting of the American Medical Association, Atlantic City, June 10, 1955.

1. (*a*) Cartwright, E. W.: Choice of Anesthesia for Normal Delivery, J. A. M. A. **145**: 1111 (April 14) 1951. (*b*) Lund, C. J.: Choices of Analgesics During the First Stage of Labor, ibid. **145**: 1114 (April 14) 1951. (*c*) Whitacre, R. J., and Cressman, P. G.: Choices of Anesthesia for Operative Vaginal and Abdominal Delivery, ibid. **145**: 1118 (April 14) 1951. (*d*) Lull, C. B., and Hingson, R. A.: Control of Pain in Childbirth: Anesthesia, Analgesia, Amnesia, ed. 1, Philadelphia, J. B. Lippincott Company, 1944. (*e*) Siegler, S. L.: The Obstetrician's View of Modern Anesthesiology, New York J. Med. **49**: 1538 (July) 1949. (*f*) Hellman, L. M.: Factors Influencing the Choice of Anaesthetic and Analgesic Methods in Obstetrical Practice, Sharp & Dohme Seminar **17**: 3, 1955.

2. Footnotes 1c, 1d, and 1e.

3. Webb, E., and Leigh, M. D.: The Private Group Practice of Anesthesiology, Anesth. & Analg. **32**: 199 (May, June) 1953. Bonica, J. J.: Unpublished data.

the background of a physician. It is for this reason that in recent years it was preferred to use residents to help during the transition period. At the present time the group consists of seven anesthesiologists, of whom three are diplomates of the American Board of Anesthesiologists and the rest have finished the required training. In addition, there are eight residents in various states of training and three interns who are on the anesthesiology service for a minimum of six weeks. Of this group four attending anesthesiologists and four to five residents are assigned to Tacoma General Hospital, where they provide all of the anesthesia service. This hospital cares only for private patients and has five operating and three delivery rooms. In 1954, 3,379 surgical operations and 2,359 deliveries were performed.

On a typical day three or four of the attending anesthesiologists and four of the residents will be on duty until the elective surgical schedule is completed. Since usually only four of the five operating rooms are used at any one time, there are usually three anesthesiologists available for obstetric service, even at the height of the surgical schedule. Although it varies with the types of surgical operations, in most instances at least two of those attending are available to administer obstetric anesthesia. These people may be located in the surgical pavilion if they are needed to supervise the resident, but if there is any activity in the obstetric pavilion they are usually found there. In any case, the operating rooms are in such close proximity to the obstetric pavilion that an anesthesiologist is available within a matter of seconds for consultation or to administer an urgent obstetric anesthetic.

After the elective surgical schedule is completed, at least three anesthesiologists are available for obstetrics and emergency surgery. In actuality an even greater number of anesthesiologists are available for the greater part of the day because after the schedule is completed, postoperative and postpartum rounds, the teaching program, and other administrative duties keep most of the personnel in the hospital. The three individuals on call usually consist of one attending anesthesiologist, one second year resident, and one first year resident. The attending anesthesiologist remains in the hospital until late in the evening and either administers the anesthetics himself or supervises the resident, depending on the particular circumstances. In this way, the residents receive personal instruction and direct supervision not only in inhalation and saddle block anesthesia but also in various types of highly technical procedures such as single or continuous segmental peridural and caudal blocks. Moreover, an effort is made to inculcate the importance of obstetric anesthesia and to imbue the residents with the enthusiasm that is necessary to accept this phase of practice. If there is no activity in the labor room, the attending anesthesiologist then goes home but remains on consultation call for all cases. During the night the anesthesiologist on first call sleeps in one of the rooms on the obstetric floor so that he or she is available within two or three minutes. The anesthesiologist on second call also remains in the hospital.

If more than three anesthesiologists are needed for emergency obstetrics and surgery, the person on first and second call in one of the other hospitals can be summoned to help. This is rarely the case because the amount of emergency surgery in this hospital is relatively small. This call schedule may be considered rigorous by some because each anesthesiologist is on call approximately every third night, but we do not find it difficult since the person on first call is off the next morning; the person on second call may be called once or twice during the night, while the person on third call is not usually called after midnight except for consultation or in the event of complications.

Whenever possible, the obstetric patients are seen before the administration of anesthesia because this affords the anesthesiologist the opportunity to obtain a history, particularly regarding previous anesthesia, and to discuss the type of anesthesia that is to be used, and, what is even more important, to give him an excellent opportunity to develop rapport. The patient is individualized for the choice of the anesthetic, and the decision is made after consultation with the obstetrician. We do not try to "sell" patients on any particular type of anesthesia unless circumstances warrant the use of a specific method. Although we favor regional anesthesia, we realize that many patients psychologically are not candidates for it. Since the members of the group are capable of administering all types of anesthesia equally well, we are able to offer a wide choice of methods. The decision as to the optimum time of initiating analgesia is usually made by the obstetrician, although in many instances it is left to the anesthesiologist, especially when a continuous block is to be used. All patients with regional blocks are attended by a member of the anesthesia department. Frequently one anesthesiologist attends several patients in the lying-in room who are receiving continuous blocks, but during the delivery each patient is attended by an anesthesiologist.

In addition to the administration of analgesia and anesthesia, the anesthesiologist supervises the administration of restorative fluids and drug therapy as indicated by the changing medical status of the mother. Moreover, he assumes the care of the newborn infant so that the airway is cleared immediately, the stomach is aspirated, and good oxygenation is secured promptly and continued until the infant breathes spontaneously. During the postpartum period daily rounds are made and the anesthesiologist takes an active part in the prevention and treatment of postanesthetic complications and in the management of respiratory problems in the infant. We deem it especially important to see these patients daily until they leave the hospital because this is not only proper anesthesiologic practice but also good public relations.

PUBLIC RELATIONS PROGRAM

In order to improve further our relations with obstetric and surgical patients, we have embarked on a long-range public relations program that requires the constant and unrelenting efforts of every member of the group, the obstetrician or surgeon, the nursing staff, and the hospital administration. The obstetricians have cooperated by informing patients about the department and emphasizing the advantages of medical anesthesia. The hospital administration also mails a booklet of information concerning the department of anesthesia

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along with other literature that is intended to inform the prospective patient about the hospital. Great emphasis is laid to proper deportment of the anesthesiologist during the postpartum visit to make the patient realize that he is a member of the obstetric team. It is a strict rule among our group that attending anesthesiologists avoid visiting patients in hospital garb but must wear street clothes, lest the patient mentally will categorize the anesthesiologist as one of the house staff. Moreover, every postpartum patient is seen by the director of the department of anesthesiology or one of the attending anesthesiologists. In addition to improving public relations, it affords us an excellent opportunity to obtain a perspective of our efforts.

Another important facet of our public relation program involves the frequent orientation of the nursing staff and the nonprofessional hospital staff, particularly those who work in the front office. With the cooperation of the director of nursing, we have been able to indoctrinate the student and graduate nurses with the importance of medical anesthesia. Our efforts in this regard are reflected by the excellent cooperation we obtain in the obstetric pavilion and on the wards. The nursing staff manifests a similar attitude and respect toward the members of our department as they do toward the obstetricians and thus imbues the patient similarly.

With this program we have encountered very little difficulty in making the patients reealize that they have received a specialized service. Moreover, this has facilitated the transition from hospital practice to private practice of anesthesiology. Patients are billed directly on a fee-for-service basis by our office, which is in a medical center located away from the hospital. All patients are sent a bill except those who have insurance with two local medical groups. We charge a basic fee for the administration of anesthesia for the second and third stage of labor. This fee, which is based primarily upon the fact that a professional service has been rendered, was decided upon by determining the duration of the average obstetric anesthesia in the hospital and what it would have cost the patient in former years when the anesthesia was administered by technicians. If prolonged blocks are administered during the first stage of labor, the fee is increased slightly for each additional hour, with a ceiling charge equivalent to four hours of anesthesia. In addition, the patient is charged a very nominal fee by the hospital for the use of drugs and equipment. At the present time it costs the patients an average of $5 more than it did for technician anesthesia. We feel that this augmentation in the over-all obstetric anesthesia fee, which represents an increase of less than 2% of the total bill in the delivery, is insignificant in view of the better services rendered and must be considered as inexpensive insurance for the added safety to mother and infant. This fact is further emphasized when it is realized that the majority of the obstetric patients pay less for their anesthesia than a patient who receives anesthesia for an appendectomy.

The fee is the same whether the attending anesthesiologist or resident gives the anesthetic. This was done in order to standardize our fees as much as possible. To obviate criticism that might be made because the patients who receive an anesthetic administered by the resident alone are billed by the group, several facts may be mentioned. Firstly, the attending anesthesiologist is available for consultation call at all times. Secondly, all expenses incurred with the residency training program, including the resident's stipend, room and board, books, and expenses involved in attending meetings and obtaining guest lecturers, are paid by the group.

COMMENT

It is generally conceded that the contribution made by the rapidly developing science of anesthesiology constitutes one of the most important factors that has made possible the great advances in surgery during the past quarter of a century. Unfortunately, the same cannot be said in regard to obstetrics. While it should be readily admitted that many of the improvements in anesthetic practice have been applied to obstetrics, the contributions in this field have not been commensurate with the progress made in anesthesiology. This is especially true in regard to the administrator, a factor that, in the final analysis, is the most important to be considered. Most of the interest in obstetric anesthesia has been focused on refinement in techniques and producing better agents, but relatively little has been written or done to encourage the development of expert administrators. It serves little purpose to discuss the selection of methods of anesthesia unless there is a corresponding effort to encourage the application of these methods with the best judgment and greatest skill. A further reduction in the mortality and morbidity in obstetric anesthesia will depend to an increasing extent on the ability of the anesthesiologist and his active participation on the obstetric team to the same extent as he participates on the surgical team.[1f] Both the anesthesiologist and obstetrician must share the blame for the fact that this is not the case at the present time.

The obstetrician has been at fault for accepting, in many instances, the barest minimum of anesthetic service at the hands of the most uninformed and the least useful person in the delivery room, whereas in his gynecologic practice he would be satisfied only with the services of an expert anesthesiologist.[1e] The obstetrician should encourage and even demand that the department of anesthesiology be organized to give the obstetric service expert administration of any type of analgesia or anesthesia, any time it is desired. If anesthesiologists cannot offer such techniques as caudal, peridural, or subarachnoid blocks as a regular service, it is inevitable that they will be unavailable when most needed. The obstetrician deserves the benefit of the anesthesiologist's skill in the management of patients whose lives are threatened by hemorrhage, toxemia, or other complications, as well as in those abnormal conditions that might interfere with the lifeline of the fetus, such as prolapsed cord, prolonged labor, eclampsia, dystocia, and premature separation of the placenta. Moreover, he should derive the benefit of the anesthesiologist's skill in the management of asphyxia neonatorum and expert knowledge of depressant drugs and be able to rely on the latter to observe and evaluate the many and varied regimens of sedatives, narcotics, and amnestic drugs recommended for the first stage of labor. The obstetrician should have the interested and informed cooperation of the anesthesi-

ologist so that he may avoid the many occasions for hazardous synergistic combinations that exist between obstetric drugs and anesthetic agents.

The provision of such services is a responsibility of the specialty of anesthesiology. Anesthesiologists must devise ways and means of satisfactorily solving the problem of providing round-the-clock anesthesia service to the obstetric department. One of the best methods of discharging this important obligation in a private hospital is for the anesthesiologists to practice as a well-organized group on a physician-patient, fee-for-service basis. Several years of experience with this form of practice have demonstrated that everyone involved benefits therefrom. The patient is provided with expert anesthesia at reasonable fees while the obstetrician may expect more efficient and more capable service and patient care. The availability of such expert services on a 24-hour basis facilitates the hospital administration and enhances the reputation of the hospital, thus greatly improving its over-all care. The most significant advantages accruing to the anesthesiologist working within the framework of such a group are that he is able to provide better services and to have more regular hours with a definite call schedule to allow time for study, teaching, and recreation. It is true, of course, that there is still a shortage of anesthesiologists and such an arrangement as herein described is obtained by an evolutionary process that requires the concerted effort and cooperation of anesthesiologists, obstetricians, hospital administrators, and the nursing staff. During the transition period, it may be necessary to use personnel other than trained physicians. However, the ultimate goal must remain the coverage of the obstetric department at all hours by expert anesthesiologists.

SUMMARY AND CONCLUSIONS

In recent years there has been an increasing awareness of the importance of anesthesia in obstetrics. Teamwork and cooperation between anesthesiologist and obstetrician are the prerequisites for optimal results in producing adequate pain relief for the mother, without detrimental effect to the infant. It is essential, therefore, that anesthesiologists take a more active part in the management of patients in labor notwithstanding their relative scarcity. It is an obligation that rests squarely on the shoulders of this group to devise ways and means of providing the anesthetic services that the patient, her infant, and the obstetrician deserve. The private group practice of anesthesiologists is one of the best means of attaining this goal. The most important advantage of such a group is that it can offer complete, expert anesthesiologic care. In addition to the selection and administration of the anesthetic best suited for the individual patient, the anesthesiologist offers his expert service for the care of the newborn infant during the neonatal period, especially if resuscitative measures are necessary. In addition, he can assist the obstetrician during the postpartum period to prevent or treat complications that may be related to the anesthetic. Moreover, the anesthesiologist's extensive experience with subnormal states of respiration and circulation may be applied to the safeguarding of the newborn infant during the critical first 24-hour period.

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CONTRIBUTIONS OF THE DOCTOR OF PHYSICAL MEDICINE AS A HOSPITAL DIAGNOSTICIAN

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The doctors who pioneered in the field of physical medicine long recognized the significant role they could play in medical practice, and they fought for recognition. They knew that treatment with physical medicine and the diagnosis and management of disease must be in expert hands for proper utilization and development.[1] They realize what a broad knowledge a doctor of physical medicine required. Consequently, they had to establish standards. Their effort was culminated in the organization of the American Board of Physical Medicine and Rehabilitation, and thus the recognition of this field of endeavor as a clinical specialty was accomplished. The requirements for the examination in physical medicine cover a broad field of medicine, surgery, and allied fields, such as biophysics, because the doctor will be called upon to deal with every type of case.[2] The physician practicing physical medicine was designated the physiatrist by the Council on Physical Medicine of the American Medical Association at its annual meeting in 1946.[3]

MAIN FUNCTIONS

The principal functions of the physiatrist in a general medical and surgical hospital are administration, diagnosis, therapy, and research. In addition, he coordinates the activities of ancillary services in a total effort to prepare the patient for a successful psychosocioeconomic adjustment following his discharge from the hospital. The ideal situation is when these functions are well blended. It does not mean that such a doctor could not have a primary interest; however, since he is representing a clinical specialty, any head of a department of physical medicine who will neglect his clinical functions for others, such as administration or research, leaving diagnosis entirely to the referring physician and therapy to the therapist, will not only misrepresent the specialty but may also do harm to the patient. It happens that physicians in charge of departments of physical medicine and rehabilitation overemphasize one function, neglecting the others. Some act purely as

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1. Kreuscher, P. H.: Status of Physical Therapy in Connection with Orthopedic Surgery, Arch. Physical Therapy **8**: 175-177 (April) 1927. A Forward Step, editorial, Brit. J. Phys. Med. **7**: 213 (March) 1933.

2. Crisp, E. J.: Future of Physiotherapist, Brit. J. Phys. Med. **4**: 106-109 (Aug.) 1941.

3. Physiatrist, Current Comment, J. A. M. A. **131**: 34 (May 4) 1946.

administrators, and all they do for the patients is correlate for them the activities of the professional and subprofessional services, with no contribution of their special skills. They almost degrade themselves to the role of a correlator [4] and poorly represent a specialty that has so much to offer. There are others who go so far as to profess that the department of physical medicine is designed only for therapists to carry out blindly the referring doctor's prescription and that the role of the physiatrist is principally only research with some administrative duties. Of course, such a contention is completely fallacious. Treatments administered by therapists without the close and direct supervision of a doctor skilled in the specialty will usually result in the routine administration of "heat, massage, and exercise." The physiatrist understands the fine effects and minute differences of physical agents and is able to apply this knowledge in correlation with his clinical findings. He can make changes in modalities and even in the entire treatment regimen according to the physical and mental condition of the patient without delay.

The purpose of this paper is to stress the role of the physiatrist as a diagnostician. He helps the referring physician by utilizing his clinical acumen as well as the modern electrodiagnostic instruments that are at his disposal. Leaders in physical medicine recognize the importance of accurate diagnosis of the condition of patients referred to the department of physical medicine for treatment, and for that reason they advocate that referral diagnoses should not be accepted unquestioned.[5] A large percentage of patients are referred to the department of physical medicine for the treatment of diseases that are diagnosed tentatively at the time of admission to the hospital or shortly afterward, pending a thorough study. The aim of referral is usually symptomatic relief with "a little heat, massage, and exercise." The random selection of physical agents at our disposal may not only be harmful but actually catastrophic. A case history, as an example, will illustrate this point, and other points will be raised in connection with the description of other case histories.

REPORT OF CASES

CASE 1.—A 55-year-old man was referred to the department of physical medicine and rehabilitation in November, 1950, for the treatment of peripheral neuritis with the following additional comments: "back pain, probably weight bearing or on postural basis." Physiatric examination revealed the following positive findings: The patient was obese, and his posture was poor, with severe relaxation of plantar arches, hallux valgus bilaterally, and round shoulders. There were moderate trophic changes of his feet, including toe nails. Pedal pulses could not be palpated. Oscillometric readings of legs were only trace and of the ankles and feet, zero. This examination indicated that patient's symptoms were caused primarily by arterial occlusion and perhaps secondarily by ischemic neuropathy of his legs. Random administration of heat and simply accepting the referral diagnosis of "peripheral neuritis" could have easily precipitated gangrene.

Another example will illustrate that postponement or no physical treatment may be the best course one can take for a patient referred to the department of physical medicine and rehabilitation.

CASE 2.—A 64-year-old man was referred to us in October, 1950, for treatment of "recent right cerebrovascular accident with spasticity of left arm." Questioning of the patient at bedside by the doctor of physical medicine revealed that the patient fell and hurt his shoulder, and there was also some indication that he was under the influence of alcoholic beverages at the time of the supposed cerebrovascular accident. It was further established that no active or passive relaxed movement was possible in the left shoulder joint, and elbow movements were also restricted due to acute pain in the shoulder. The examiner suspected fracture of the humerus and recommended postponement of physical treatments until x-ray findings were known. Subsequently, it was revealed that patient had a fracture of the neck of the humerus. A hanging cast was applied after the patient's transfer to the orthopedic section. The patient became ambulatory in two days with no residue of any central nervous system insult. The diagnostic acumen of the physiatrist was obviously very contributory in this instance, and prompt initiation of treatments upon referral might have done great harm to the patient.

Frequently patients referred to the department of physical medicine for treatment are treated too long with no regard for expense and improvement. Physical medicine is oftentimes accused of unnecessary treatments. Such practices can be counteracted by the physiatrist implementing periodic reevaluations and by a standing order to therapists to report intolerance to treatment. A case history will illustrate this point.

CASE 3.—A 23-year-old man was referred to the department of physical medicine and rehabilitation in January, 1951, for treatment of lumbosacral strain with diathermy, massage, and hyperextension back exercises. At that time patient was not examined by the physiatrist for the sake of expedience and because suggested treatments seemed adequate. One week later the therapist reported that patient was unable to tolerate hyperextension exercises. I went to see him when he was on the treatment table. I noted an old empyema scar. On slight touch of the scar, the patient became very belligerent and shoved the examiner's hand off. Watching the treatment, I found that he was totally uncooperative. An examination revealed the following history: The patient alleged pain across his back without radiation. He claimed that he was hospitalized the previous year. A myelogram was done after which he was discharged without treatment. He alleged pain since 1946 (five years) after an amphibious landing. Examination also revealed the patient was extremely jittery. Horizontally extended hands showed coarse tremor. His face looked tense and sunken. The empyema scar in the right axillary was very well healed and tender, but his reaction was not consistent to palpation. The patient alleged acute tenderness on slight touch of the lumbar muscles and spine. He flexed his body with knees extended, reaching 30 in. from the floor. Other movements were also extremely guarded. Paravertebral muscles were relaxed. Heel jar test elicited no pain, although the patient did not carry it out properly. It was the impression of the examiner that even though the patient might have recurrent lumbosacral strain, there was a 100% functional overlay. Psychiatric evaluation was recommended. The physician attending the patient was contacted, and physical treatments were discontinued. It was subsequently revealed that neuropsychiatric examination resulted in the establishment of the diagnosis of "conversion hysteria," and shock therapy was recommended.

The physiatrist is in a position to assist his colleagues in their diagnostic efforts by the utilization of modern electrodiagnostic instruments such as the constant current impulse stimulator developed by Golseth and Fizzell [6] and the electromyograph. The former per-

4. Elkins, E. C.: Educational Problems in Physical Medicine and Rehabilitation, Arch. Phys. Med. **30**: 623-629 (Oct.) 1949.

5. Rusk, H. A.: Physical Medicine and Rehabilitation: Problems of Education, Arch. Phys. Med. **32**: 137-142 (March) 1951. Huddleston, O. L.: New Horizons and Current Problems in Physical Medicine, Arch. Phys. Med. **29**: 623-628 (Oct.) 1948. Mead, S.: Responsibilities and Privileges of Physiatrist, South. M. J. **46**: 1197-1199 (Dec.) 1953.

6. Golseth, J. G., and Fizzell, J. A.: Constant Current Impulse Stimulator, Arch. Phys. Med. **28**: 154-158 (March) 1947.

mits us to gather important data on muscles by determining of the strength-duration curve, chronaxy, and repetitive, galvanic-tetanus, and rheobase ratios. The latter records the action potentials that develop in

Data Obtained with Constant Current Impulse Stimulator in Patient with Deltoid Weakness

Strength-Duration Curve *

Dial Setting		Duration of Impulse,	Direct Current,	
Interval	Duration	Milliseconds	Ma.	Electrode Placement
4	16	500	2.0	Indifferent; insertion
4	15	300	2.0	of deltoid, right
4	14	100	2.0	
4	13	75	2.0	Active; over acromion
4	12	54	2.0	process
4	11	40	2.0	
4	10	29	2.0	
4	9	20	2.0	
4	8	14	2.0	
4	7	10	2.6	
4	6	7	3.0	
4	5	5	4.0	
4	4	3	4.5	
4	3	2	5.5	
4	2	1.5	6.5	
4	1	1	8.8	

Repetitive Stimuli

Dial Setting				
Interval	Duration	Cps	Ratio	
1	1	500	3.5	1:1
2	1	196	8.0	1:2.3
3	1	77	10.0	1:2.8

Tetanus Ratio

Dial Setting			Direct		Direct
Interval	Duration	Contraction (Cathode)	Current, Ma	Contraction (Anode)	Current Ma.
5	17	Rheobase twitch	1.8	Rheobase twitch	3.2
5	17	Tetanus	5.5	Tetanus	...
		Cathodal tetanus ratio	3.1	Rheobase ratio	1.7

* Chronaxy in milliseconds, 5; no discontinuities; faradic response, present. Chronaxy by another method (rheobase 15 volts), 10 milliseconds.

skeletal muscles. The clinical interpretation of this pool of information with correlation of clinical findings oftentimes furnishes us with convincing diagnostic clues

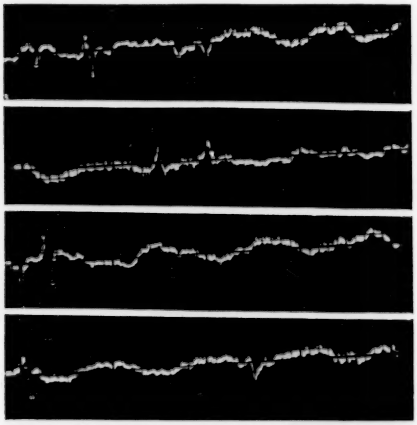

Fig. 1.—Electromyographic tracings of the middle deltoid muscle at rest: spontaneous diphasic and monophasic action potentials of some 20 to 50μ in amplitude and 2 to 3 milliseconds in duration. These are fibrillation potentials typical of lower motor neuron involvement.

7. Paul, W. D.: What Every Physician Should Know About Hospital Practice of Physical Medicine and Rehabilitation, Arch. Phys. Med. **31**: 44-46 (Jan.) 1950.

that could not be arrived at by purely clinical means. The following case history will illustrate this point.

Case 4.—A 41-year-old male was referred to the department of physical medicine and rehabilitation Oct. 17, 1950, for treatment of "bursitis, right shoulder." The patient gave a history of "pain in the right shoulder, down to arm" of two and one-half weeks' duration. He also complained of numbness in all his fingers. It was obvious that the patient favored the right upper extremity by holding the arm in acute adduction. Functional muscle examination revealed "T" to "P" strength of the deltoid, latissimus dorsi, teres minor, and infraspinatus. There was only 20 degrees and 30 degrees of actual limitation in the shoulder joint. Tapping of the deltoid revealed fasciculation. Reflexes were normal, and there were no sensory changes to pin prick. Inasmuch as the referral diagnosis of bursitis did not satisfy the examiner, further studies, such as cervical spine x-ray and spinal fluid examination, were recommended and proved to be normal. The referring physician consulted two neurologists, and both were of the opinion that the patient's symptoms were caused by disuse. Electrodiagnostic studies confirmed the original impression of the physiatrist that the right deltoid muscle was truly paretic. The table lists the information gathered with the constant current impulse stimulator and the clinical interpretation of the examiner. The examiner's impression was that the electrical pattern indicated lower motor neuron involvement. The impression was of a partial lesion (i. e., part of the fibers normal, part denervated); hence, the muscle still responded to the faradic current. The long S-D curve, with a tilt of the strength-frequency ratio toward a 1:2:3 ratio, suggested a demyelination process. Figures 1 and 2 are samples of electromyographic tracing that clearly show numerous action potentials in the resting middle deltoid. These are fibrillation potentials. In the light of such convincing evidence, the diagnosis was changed to acute neuritis with paralysis, etiology undetermined. The patient was subsequently treated on the basis of this diagnosis; he improved and was discharged.

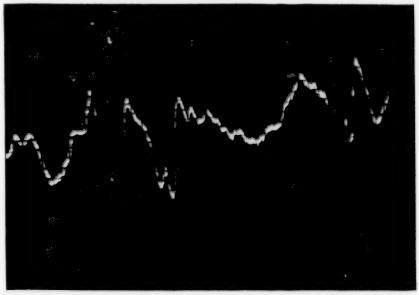

Fig. 2.—Electromyographic tracings of the middle deltoid muscle on effort: simple and polyphasic potentials of 150 to 200μ in amplitude and 3 to 5 milliseconds in duration. These potentials are characteristic of weak or paretic muscles.

SUMMARY

The physiatrist has an important role as a diagnostician in a general medical and surgical hospital. Medical literature [7] points out that the physician trained in physical medicine, by virtue of his training and experience, must have more detailed knowledge of certain diseases such as arthritis, peripheral vascular diseases, poliomyelitis, peripheral nerve injuries, cerebral palsy, and spinal cord injuries. I feel that many members of the medical profession are not aware of the help a trained and qualified physiatrist can offer general practitioners and many specialists in diagnosing diseases and treating their patients.

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PLACEMENT OF REHABILITATED PATIENTS

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and
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It is our purpose to make a progress report on a joint undertaking entered into by the vocational rehabilitation service, Department of Education, commonwealth of Virginia, and the McGuire Veterans Administration Hospital, Richmond, Va., wherein the commonwealth detailed to McGuire a state vocational counselor on a full-time basis. Thus the full facilities of the state in the areas of vocational counseling and job placement were brought to the veteran at the earliest practical moment in his illness or after his injury. As it was determined that we were to make a pilot study, prior approval was obtained from the central office of the Veterans Administration and the office of vocational rehabilitation, Department of Health, Education, and Welfare. The office of vocational rehabilitation underwrote the salary of our counselor for a trial period as a part of its research program. The Veterans Administration has had in operation for some time a well-developed and quite effective program of vocational counseling and job placement. However, the Veterans Administration's program was designed for and was primarily intended for persons with service-connected cases and was not expected to render adequate coverage to those with non-service-connected cases. The activities of the state in this study were limited to non-service-connected cases.

TYPE AND DISTRIBUTION OF CASES

In the late 1940's it became apparent that, while medicine and surgery were reaching a high degree of effectiveness in saving lives and restoring function, we in rehabilitation could not carry out our responsibilities without state aid in handling non-service-connected cases. Although the non-service-connected case load was not large volumewise, the cases were predominantly of the "dread disease" or "catastrophic injury" category. As will be seen later, numerically presented, we were dealing with paraplegic, psychotic, tuberculous, and orthopedic patients, patients with acute and chronic neurological conditions, and a few patients with general medical and surgical conditions. These were patients who required maximum rehabilitation efforts and careful job-study placement if rehabilitation to employability was to be accomplished. For a while we had the services of a state counselor on an itinerant basis. This approach was found to be inadequate. It failed in the two most important areas: first, that of early counseling, and, second, complete teamwork follow-through. We, therefore, requested of the commonwealth that a full-time vocational counselor be detailed to our hospital, and this was done in May, 1951. For our study we have selected the 18 month period between July 1, 1951, and Dec. 30, 1952, in which there were 400 cases. A follow-up study was made the first three months of this year; i. e., Jan. 1 through March 31, 1955.

Although it was originally not the purpose of this paper to discuss the therapeutic value of vocational counseling, this was such a striking feature that we wish to comment on it. Most of these patients were in their late 20's or early 30's; they had been discharged from the service a matter of three to five years, and they had young families. By and large, they were just getting started in a business or a vocation when a catastrophe struck them. Some of the patients were so overwhelmed as to be unable to fight their way back to vocational adjustment. In our study we used the term "lack of motivation" to describe this condition. It is not a term that we prefer, because we believe that we are dealing with such factors as fear, resentment, self-pity, and mother fixation. Early vocational counseling combined with other rehabilitation activities did much to prevent these emotions from developing a fixed pattern of action. There are certain additional features of this group that should be mentioned. 1. None of these patients was sent to the hospital for physical restoration in connection with an already planned vocational objective. 2. None of these patients was able to return to his former employment without modification of working conditions. 3. A few were able to return to related or similar employment. 4. A few patients were reemployed by their former employers in different job classifications.

The table shows the general distribution of cases and certain totaling data. This table is divided into three sections. The section on cases gives the number of patients worked with and certain basic data concerning them. The section on patients who were rejected gives the three reasons for rejection: (1) service-connected disabilities, (2) lack of motivation, and (3) rehabilitation medically unfeasible. The section on status shows the number of patients accepted for training and/or job placement and gives the outcome of efforts directed to this end. The type of patients that we were working with is shown in column 1. The first five categories of patients—i. e., neurological, tuberculous, psychiatric, paraplegic, and poliomyelitic—by their very nature present major rehabilitation problems. In addition to this, one of us (A. R. D.) would like to comment on the severity of disease or injury seen in a Veterans Administration hospital as compared with a similar group seen in a large state or municipal hospital. In those categories of conditions where patients can be adequately treated by office procedures or at most a few days of hospitalization, the person with a non-service-connected case does not usually come to a Veterans Administration hospital. It is those among this group with severe cases and those requiring prolonged hospitalization who seek Veterans Adminis-

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Read before the Section on Physical Medicine and Rehabilitation at the 104th Annual Meeting of the American Medical Association, Atlantic City, June 9, 1955.

tration hospital care. This is best exemplified by our findings in the neurological and general medical groups; rehabilitation of 31 of 49 neurological and 16 of 31 general medical patients was finally found to be unfeasible for medical reasons.

Number of Patients.—Column 2 gives the total number of patients divided into categories and reflects the nature of our hospital and the type and volume of problem that presents itself to us. As can be seen from the total, we have a large neurological service, a fairly large psychiatric service for a general hospital, and a large paraplegic service, as well as a poliomyelitic service with respirator facilities.

Mean Age.—Column 3 gives the mean age of the patients. We have commented on this before; however, we would like to point to the higher age levels found among neurological and medical patients. This is even more striking when we study the age distribution pattern and find such a large number of patients in the 50 to 65 age groups.

ice and the case folder was removed from the files of the state counselor. As can be seen in the table, there were 43 such patients, with the largest number among the paraplegics. Column 7 shows the number and percentage of patients rejected for lack of motivation. We have found that lack of motivation has not shown itself percentagewise to be the big block to rehabilitation that could be expected. In addition, we believe that as we learn more about the emotional components accompanying severe disability many of the associated factors may be extracted and found amenable to treatment. We wish to reemphasize that our findings lead us to believe that early rehabilitation endeavors and early vocational counseling had much to do with preventing frustration and dependency patterns from developing. Column 8 concerns the cases in which rehabilitation was medically unfeasible. Because of factors already enumerated in this discussion, we found this element to be particularly high in the medical and neurological groups; however, for the remainder of our study, medical unfeasibility was not

Results of Cooperative Program Between State Rehabilitation Service and McGuire Veterans Administration Hospital, July 1, 1951, to Dec. 30, 1952

	Cases				Rejected						Status								
					Service-Connected Case		Lack of Motivation		Medically Unfeasible							Employed			
Diagnosis	Total	Median Age	Out-of-State	Virginia	No.	%	No.	%	No.	%	Accepted	Hospitalized	Training	Unknown	Deceased	Employment Pending	No.	%	Total Wages, $
Neurological	51	37	19	32	2	3.9	5	9.8	31	61.0	13	..	1	5	..	..	7	53.9	11,228
Tuberculous	52	33	8	44	3	5.7	8	15.0	5	9.6	36	2	2	7	..	..	25	69.4	52,465
Psychiatric	75	33	9	66	7	9.3	15	20.0	13	17.4	40	2	..	5	..	..	33	82.5	93,245
Paraplegic	157	30	88	69	26	16.5	14	8.3	15	8.9	102	32	6	16	1	5	42	41.0	93,553
Poliomyelitic	4	33	4	..	..	....	..	....	..	....	4	..	..	..	..	..	4	100	11,350
Medical	32	38	3	29	1	2.8	4	10.6	16	42.0	11	..	..	3	1	..	7	63.6	11,100
Orthopedic	29	31	8	21	4	13.8	3	10.4	4	13.8	18	..	..	2	..	..	16	88.8	32,450
Total	400	..	139	261	(43	....	49	....	84	....)	224	36	9	38	2	5	134	59.8	305,391
					176-44%														
Column (1)	(2)	(3)	(4)	(5)	(6)		(7)		(8)		(9)	(10)	(11)	(12)	(13)	(14)	(15)		(16)

Out-of-State Cases.—Columns 4 and 5 compare the patients from out-of-state to those from the state, with the largest out-of-state group being paraplegic. We did not find the same degree of accuracy in following the out-of-state patients that we found within the state of Virginia; this was perhaps due to distance and multiple authorities. State versus nonstate residence of patients had little effect on our findings. In the actual vocational counseling and job placement of the patient we were much pleased with the full cooperation that we received from out-of-state authorities. We believe this condition reflects the high degree of efficiency the vocational rehabilitation services have attained in all of the states with which we cooperated.

Reasons for Rejection.—Columns 6, 7, and 8 with their percentages depict the reason why patients were rejected for training and/or job placement. Column 6 shows how many patients with service-connected conditions were rejected. If a patient's claim for service connection was adjudicated as "service connected" while the state counselor was working with him, this patient was immediately turned over to the veteran's counseling service and the case folder was removed from the files of the state counselor. As can be seen in the table, there were 43 such patients, with the largest number among the paraplegics. Column 7 shows the number and percentage of patients rejected for lack of motivation. We have found that lack of motivation has not shown itself percentagewise to be the big block to rehabilitation that could be expected. In addition, we believe that as we learn more about the emotional components accompanying severe disability many of the associated factors may be extracted and found amenable to treatment. We wish to reemphasize that our findings lead us to believe that early rehabilitation endeavors and early vocational counseling had much to do with preventing frustration and dependency patterns from developing. Column 8 concerns the cases in which rehabilitation was medically unfeasible. Because of factors already enumerated in this discussion, we found this element to be particularly high in the medical and neurological groups; however, for the remainder of our study, medical unfeasibility was not above what would normally be expected. A total of 176 or 44% of the patients (i. e., columns 6, 7, and 8) were rejected for training and/or job placement for one of the reasons enumerated above, leaving 224 patients (column 9) who were accepted for training and job placement.

Results of Accepted Cases.—Of the group of 224 who were accepted, 36 (column 10) are now hospitalized, 9 (column 11) are in training, and 38 (column 12) could not be followed up at the time this paper was prepared. Two (column 13) are known to be deceased. Five (column 14) have employment pending. Column 15 reveals that 134 or 59% of those accepted are now employed and earning $305,391 (column 16) per annum, an average of $2,279 a year.

EFFECT OF COUNSELING

One might logically ask how many of these people would have found employment had there not been a vocational counseling service available. This, of course, is a question that constantly plagues us. There is no ready answer, but we do know from clinical experience

that before having a full-time counselor for this group of persons with non-service-connected cases very few of them found suitable employment and that as soon as we had the full facilities of the commonwealth of Virginia at our command a changed picture became evident almost at once. We are convinced that early rehabilitation and complete vocational counseling plus job placement pay handsome dividends in happiness and financial returns.

RESULTS WITH PSYCHIATRIC GROUP

We had hoped to analyze our findings in some detail in relation to each category, but as space will restrict us to a few remarks relative to only one category, we would call attention to the psychiatric group, which includes the psychotic. The results of work with these patients both during this study and since Dec. 30, 1952, has been most gratifying. There seems to be such a tendency to shy away from job-placing the patient who has been psychotic that we wish to emphasize the good features of handling this group. It will be noted that of the 75 handled, 40 were finally accepted for training and/or job placement; of the 40 accepted, 33 are now known to be employed. They are making $93,245 annually, with an average yearly income of $2,825, which is some $600 better than the group average. It has been our experience that when both the employees and the employers are adequately counseled regarding what can be expected in a job situation much of the cloudiness surrounding employment of persons who have been psychotic disappears. To place adequately a person who has been psychotic we must take into consideration his basic personality pattern and relate to it his future working conditions. Such things as noise of work, need to meet the public versus lack of it, and pressure to make decisions versus repetitive work processes become major factors in his adjustment. Among the 40 persons accepted, psychiatric diagnoses varied from mild conversion reaction to psychosis requiring lobotomy. In fact, two of the employed persons are patients in whom lobotomy was done. The largest number, as would be expected, were schizophrenic. We believe this group deserves more attention than we have given it in the past.

One of us (R. N. A.) would like to emphasize that in dealing with severely disabled patients there must be the closest cooperation between vocational counseling, job placement services, and the medical services. In addition, there must be medical follow-through to the actual working situation and, at times, medical counseling of the patient and the employer after the patient is on the job.

SUMMARY

Over a period of 18 months 400 severely disabled veterans were studied and treated in a joint project of the physical medicine and rehabilitation service and the vocational counseling service, McGuire Veterans Administration Hospital, Richmond, Va., and the vocational rehabilitation service, Department of Education, commonwealth of Virginia. The study was concerned chiefly with the 357 persons whose disabilities were non-service-connected. Follow-up data were collected three years after the close of the test period. Of the 357 patients with non-service-connected disabilities, 133 were not accepted for job placement because of various reasons. Of the 224 accepted, 134 or 59.8% were gainfully employed at the time of the follow-up; their average annual salary was $2,279 per year. The earlier in the patient's disability that rehabilitation and vocational counseling are begun, the better are the therapeutic results, physical and psychological, and the better the vocational rehabilitation. In this study, the results with psychiatric patients, including psychotic, have been gratifying. Of 40 such patients accepted for job placement, 33 or 82.5% were gainfully employed at the time of the follow-up. Their average annual earnings were $2,825, or better than the average for the whole group. Close cooperation between the physician, vocational counselor, and job placement service is an essential feature in dealing with the severely disabled.

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CLINICAL NOTES

DIAGNOSTIC ERRORS DUE TO HIGH SPINAL FLUID LEUKOCYTE COUNT IN SUBDURAL HEMATOMA

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and
Frank E. Nulsen, M.D., Cleveland

There have been numerous reports of subdural hematoma since the condition was first described as an entity by Putnam and Cushing in 1925. However, the white blood cell reaction of the meninges in this disorder has been mentioned in very few reports and the spinal fluid white cell count has not been given consideration as a finding that might lead to an error in diagnosis. The consensus of opinion has been expressed in an early article by Munro,[1] who concluded that exploratory trephination of the skull was indicated whenever patients showed progressive mental changes or neurological signs and the cellular count of the cerebrospinal fluid ruled out meningitis. Others have stressed that neither failure to elicit a history of head trauma nor the finding of normal or reduced spinal fluid pressure eliminates subdural hematoma as a cause for progressive deterioration in behavior and responsiveness. In the following two cases of subdural hematoma an atypical finding, a leukocytic reaction in the spinal fluid, led to an erroneous diagnosis of meningitis and operative intervention was therefore delayed.

REPORT OF CASES

CASE 1.—A 13-year-old Negro boy was admitted to the neurosurgical service at the Hospital of the University of Pennsylvania on Nov. 13, 1948. This boy was considered by his guardian to have been in excellent health until two weeks prior to admission, when he began to complain of headache, refused to go to school, and ate poorly at home. This headache increased in severity and became associated with vomiting as well as increasing lethargy and confusion. He was rushed to the hospital when it became

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Dr. Francis C. Grant gave permission for inclusion of case 1.

1. Munro, D.: The Diagnosis and Treatment of Subdural Hematomata: A Report of 62 Cases, New England J. Med. **210**: 1145-1160, 1934.

almost impossible to arouse him. Examination showed a well-nourished young male who lay quietly in bed. He would respond to simple commands and say a few words with persistent urging. He responded to painful stimuli by moving his extremities in symmetrical fashion and by grimacing symmetrically. There was striking nuchal rigidity with a bilateral Kernig's sign. The optic fundi showed venous engorgement without definite papilledema. The pupils were equal in size, and there was limitation in the lateral movement of each eye, suggesting bilateral sixth nerve involvement. The extremities showed reduced tendon reflexes with bilateral Babinski signs. His temperature was 100 F, pulse rate 60 per minute, respiration rate 16, and blood pressure 130/88 mm. Hg.

Lumbar puncture revealed slightly xanthochromic fluid under more than 600 mm. pressure in the reclining position. Despite the elevated pressure, the Queckenstedt maneuver was employed to demonstrate open manometrics. The immediate blood cell count showed 140 leukocytes per cubic millimeter (90% lymphocytes) and no erythrocytes. Subsequent chemical studies showed that this fluid had a sugar content of 55 mg. per 100 cc. Neurosurgical consultation was promptly requested. The central nervous system depression with increased intracranial pressure, in combination with signs of meningeal irritation and a spinal fluid lymphocytosis, was considered consistent with tuberculous meningitis, but brain abscess remained a possibility. Skull x-rays showed no definite abnormality (the pineal gland was not visualized). A chest film showed no abnormalities. Occipital trephines were then accomplished with the patient under local anesthesia in order to give access to the ventricles. The cortex bulged on opening of the dura on each side. Each lateral ventricle was readily encountered with a cannula and fluid escaped under moderately increased initial pressure with each ventricle draining about 15 cc. Since this ventricular estimation gave the impression of no ventricular enlargement or asymmetry to suggest a large mass lesion and since the patient's condition seemed, if anything, improved, it was decided to postpone introduction of air for ventriculography until morning, with the patient observed closely meanwhile. Three hours later, without any previous fluctuation in vital signs or responsiveness, the patient abruptly died.

Autopsy revealed a 200 cc. subdural collection of fluid on the left consisting of dark liquefied blood enclosed in a thin yellow-stained membrane. Its posterior limit stopped just short of the left occipital trephine. The collection was of sufficient size to be consistent with critically increased intracranial pressure. There were associated herniations of the left uncus through the incisura and of cerebellum through the foramen magnum as the probable explanation for respiratory cessation. Subsequent study revealed no lesions in the brain parenchyma except for a few petechial hemorrhages in the pons. The meninges showed no inflammatory reaction on microscopic study.

CASE 2.—A 46-year-old Negro female was brought to the emergency ward of University Hospitals of Cleveland on April 4, 1954, in a semiconscious state. The patient had been struck on the head approximately 48 hours prior to the time of admission with no resulting loss of consciousness. Twenty-four hours later, she became very quiet and did not respond well to requests. She was, however, able to ask for assistance to the bathroom and for water to drink. She remained in bed most of the time during the 12 hours preceding admission.

Physical examination revealed a well-developed, moderately obese Negro female who responded slowly to simple commands. Temperature was 39.2 C, pulse rate 100 per minute, respiration rate 28, and blood pressure 180/90 mm. Hg. There were no lacerations of the scalp or face. There was conjunctival hemorrhage and ecchymosis of the eyelid and surrounding soft tissue of the right eye. There was moderate nuchal rigidity, with a positive Kernig's sign. Lumbar puncture revealed xanthochromic fluid under 340 mm. pressure in the reclining position. The immediate blood cell count showed 6,850 leukocytes (100% polymorphonuclear leukocytes) and 5,050 erythrocytes per cubic millimeter. Subsequent chemical studies showed that this fluid had a sugar content of 55 mg. per 100 cc. and a protein content of 220 mg. per 100 cc. Gram and Ziehl-Neelsen stains of the spinal fluid did not reveal the presence of bacteria. The peripheral leukocyte count was 10,100, with a normal differential count.

Skull roentgenograms showed no evidence of a fracture, and the pineal gland could not be identified. The signs of meningeal irritation and the marked polymorphonuclear leukocyte response in the cerebrospinal fluid were considered strong evidence for acute bacterial meningitis. It was decided to watch the patient closely and to treat her with penicillin and streptomycin. Lumbar puncture performed 12 hours after admission revealed xanthochromic fluid under 240 mm. pressure. There were 2,028 leukocytes per cubic millimeter (98% polymorphonuclear leukocytes). Subsequent chemical studies showed that this fluid had a sugar content of 53 mg. per 100 cc. and a protein level of 220 mg. per 100 cc. Twenty-four hours after admission, the patient's pulse suddenly decreased from an average of 104 to 80; the other vital signs remained stable. At that time it was also noted that there was slight dilatation of the right pupil and conjugate deviation of the eyes to the right. The following morning it was believed that the patient was becoming less responsive. Lumbar puncture at that time showed xanthochromic cerebrospinal fluid with a leukocyte count of 520 (61% polymorphonuclear leukocytes), a sugar level of 67 mg. per 100 cc., and protein level of 264 mg. per 100 cc.

A relatively dilated right pupil and decreasing responsiveness were considered indications for trephination. This was performed 36 hours after admission. A subdural hematoma was encountered in right frontal and parietal trephines, and a considerable amount of semisolid clot was evacuated by through-and-through irrigation. The patient's condition improved only temporarily. Ventriculography was therefore performed three days later. This revealed a displacement of the ventricular system toward the left, with the third ventricle being centered 1.2 cm. from the midline. Accordingly, craniotomy was performed immediately and an extensive solid hematoma was evacuated from the right subdural space. This lay inferior to the previous burr holes, reaching maximum thickness over the temporal lobe. The patient had a satisfactory recovery postoperatively and she was discharged 25 days following craniotomy. The only residual neurological change was a left homonymous hemianopsia. Spinal fluid leukocytes were reduced to 2 mononuclear leukocytes per cubic millimeter, and she was afebrile by the eighth postoperative day. Eight months postoperatively the patient was managing her household effectively and was not consciously disabled by her residual difficulty in seeing toward the left.

COMMENT

In the first case, in which there was a history of progressive deterioration with critical depression of the central nervous system and increased intracranial pressure, chronic subdural hematoma was considered improbable because of the cellular reaction in the spinal fluid. Trephination was carried out, but in a fashion too limited to exclude this possibility with the unfortunate postponement of ventriculography since the patient's condition did not appear critical. His sudden decompensation to increased intracranial pressure and the cerebellar pressure cone found at autopsy may well be related to the lumbar puncture and the Queckenstedt test carried out in the face of increased intracranial pressure. Nevertheless, had the presumption of a subdural hematoma not been discarded because of the cerebrospinal fluid blood cell count, the boy in this case would almost certainly have been saved. In the second case, surgical intervention was delayed 36 hours because the spinal fluid leukocyte count, which was greater than the spinal fluid erythrocyte count, was believed to be too high to represent an aseptic meningeal reaction. Happily, previous experience now dictated that a clinical situation consistent with subdural hematoma should be treated as such in disregard of spinal fluid findings, so that operation was undertaken before irreversible damage occurred.

Let us now consider possible explanations for this unusual cellular reaction in subdural hematoma. Merritt

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and Fremont-Smith,[2] in a study of the spinal fluid leukocyte count in 54 cases of acute subdural hematoma, reported one case in which there was a marked aseptic meningeal reaction, there being 2,400 polymorphonuclear leukocytes per cubic millimeter. In the same report, autopsy-proved cases of intracerebral hemorrhage were reviewed and the greatest aseptic meningeal reaction was represented by a spinal fluid white cell count of 3,600 leukocytes per cubic millimeter, 90% being polymorphonuclear leukocytes. Hammes,[3] in a study of 53 autopsy-proved cases of ruptured intracranial aneurysm with subarachnoid hemorrhage, concluded that the leukocyte reactions in the meninges usually increased progressively until the third day after bleeding, but at no time was a polymorphonuclear leukocyte response comparable in intensity to the reaction in acute bacterial meningitis.

The low-grade cellular reaction in the spinal fluid in the first case in the presence of xanthochromia would seem comparable to the above findings—a meningeal reaction to remote subarachnoid bleeding caused by the same trauma that initiated the slowly growing subdural collection. The intense meningeal reaction with the resulting high spinal fluid polymorphonuclear leukocyte count that was present in the second patient is an exception to the findings of the above-mentioned workers and is an example of a case of acute subdural hematoma with unusual leukocytic reaction to associated subarachnoid bleeding. It was erroneously diagnosed as an acute bacterial meningitis because the polymorphonuclear leukocyte response was not thought to be consistent with an aseptic meningeal reaction. Both cases emphasize that the leukocyte count of the spinal fluid can be misleading if it is used to rule out a diagnosis of acute subdural hematoma.

It is generally realized that the trauma producing subdural bleeding giving rise to hematoma can be accompanied by a cortical contusion and subarachnoid bleeding. Just as the finding of bloody spinal fluid by lumbar puncture after trauma does not militate for or against an associated subdural hematoma, so also polymorphonuclear or lymphocytic cells in spinal fluid consequent to subarachnoid bleeding and meningeal irritation do not rule out subdural hematoma. A hint that the leukocytic reaction might have been due to previous subarachnoid bleeding rather than infection was afforded by the xanthochromic character of the supernatant spinal fluid when grossly bloody (case 2) or its yellow color when erythrocytes were no longer present (case 1). The absence of bacterial infection was then further established by the finding of normal spinal fluid sugar content in each instance.

SUMMARY

Two cases of subdural hematoma in which elevated spinal fluid leukocyte counts led to erroneous diagnoses of meningitis emphasize that the leukocyte count of the cerebrospinal fluid is not, by itself, diagnostic of meningitis and should not prevent exploratory trephination of the skull when a growing intracranial mass is suggested by progressive deterioration of sensorium. Because of the insidious behavior of the subdural hematoma, even a temporary misdirection in the management of such a case as probable meningitis can result in fatality, while complete recovery can be achieved by early surgical intervention.

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2. Merritt, H. H., and Fremont-Smith, F.: The Cerebrospinal Fluid, Philadelphia, W. B. Saunders Company, 1938.

3. Hammes, E. M., Jr.: Reaction of the Meninges to Blood, Arch. Neurol. & Psychiat. **52**:505-514 (Dec.) 1944.

GLUCOSE-INSULIN TOLERANCE TEST IN RHEUMATOID ARTHRITIS

STUDY OF TWENTY-NINE CASES

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There is still doubt concerning the presence of pituitary or adrenal insufficiency in patients with rheumatoid arthritis. The glucose-insulin tolerance test has previously been studied by several authors and is considered a good index of pituitary and adrenal function.[1] The test is based on the observation that, in normal individuals, the administration of glucose (30 to 60 minutes after insulin-induced hypoglycemia) is followed by hyperglycemia of greater intensity than that obtained by giving glucose without previously giving insulin.[2] Thus, administration of glucose accentuates the homeostatic reaction to hypoglycemia, believed to be mediated by hormones of the anterior pituitary and from the adrenal cortex and medulla.

Patients with adrenal or pituitary insufficiency and with hyperinsulinism show an exaggerated reaction to insulin, and spontaneous rise in the blood sugar level after induced hypoglycemia is retarded.[1a] One of the advantages of the glucose-insulin test is that, with the administration of glucose, the danger of a marked degree of hypoglycemia is avoided. It is well known that, in the presence of a marked degree of adrenal insufficiency, hypoglycemia can be fatal. Nevertheless, in suspected cases of adrenal cortical hypofunction (Addison's disease) or hypopituitary cachexia (Simmond's disease), it is advisable to use only one-half or one-third of the usual dose of insulin. This test has been analyzed in various morbid conditions and was found to be of value in the diagnosis of adrenal and pituitary insufficiency.[1a] In nine patients with prolonged malnutrition, secondary to nervous anorexia, serious organic disease, and uncontrolled vomiting (neurosis), the test was normal in seven cases, abnormal in one (nervous anorexia), and doubtful in one.[1a] Rapid and distinct rise in blood sugar level after insulin and glucose therapy is a strong argument against the presence of adrenal or pituitary insufficiency. However, there are authors who believe that the alterations of glucose metabolism are not the cause but the secondary effect of the rheumatic process.[3]

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1. (*a*) Engel, F. L., and Scott, J. L.: The Insulin-Glucose Tolerance Test: A Modified Procedure for the Detection of Hypoglycemia Unresponsiveness in Pituitary and Adrenal Insufficiency, J. Clin. Invest. **29**: 151, 1950. (*b*) Fraser, R. W.; Albright, F., and Smith, P. H.: The Value of the Glucose Tolerance Test, Insulin Tolerance Test and Glucose-Insulin Tolerance Test in the Diagnosis of Endocrinologic Disorders of Glucose Metabolism, J. Clin. Endocrinol. **1**: 297, 1941.

2. Footnote 1*b*. Somogyi, M.: A Paradoxical Effect of Insulin on Glucose Assimilation, Federation Proc. **7**: 190, 1948.

SUMMARY

The study of the glucose-insulin tolerance test, as a method of determining the possible presence of adrenal or pituitary insufficiency in patients with rheumatoid arthritis in the various evolutive stages of the disease, gave normal results in two groups of patients. In one group of 12 cases studies were done by the technique of Fraser and co-workers and in the other group of 17 patients by the technique of Engel and Scott.

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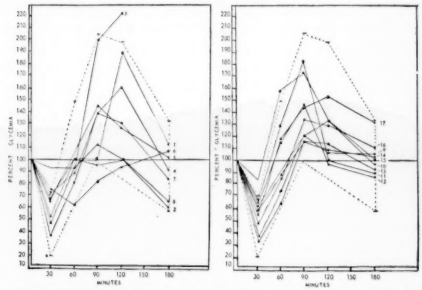
TECHNIQUES OF GLUCOSE-INSULIN TESTS

We studied the glucose-insulin tolerance test as a method of investigating the possible presence of adrenal or pituitary insufficiency in a group of 29 patients with rheumatoid arthritis. Among those, 26 patients had a good general condition and nutritional status and the remaining 3 (cases 5, 6, and 7 of group 2) did not. In the first group of 12 patients we applied the technique of Fraser and co-workers,[1b] and in the second group of 17 patients the technique used was that of Engel and Scott.[1] The previous diet of both groups was a regular one.

Technique of Fraser.—In Fraser's technique [1b] the first sample of blood is collected in the fasting state, immediately followed by the oral administration of 100 gm. of glucose and 0.1 units of regular insulin given intravenously per kilogram of body weight. Additional samples of blood are taken after 20, 30, 45, 60, and 90 minutes. About 120 minutes later, 0.01 ml. of epinephrine was injected intramuscularly, and additional samples of blood are taken after 165 and 180 minutes. By the simultaneous administration of glucose and insulin the changes in serum glucose levels normally are very slight. After the administration of epinephrine, with the intention of mobilizing hepatic glycogen, the glucose level must increase between 35 and 45 mg. per 100 cc. in 40 to 60 minutes. With this technique we studied one group of 12 patients in the various evolutive stages of rheumatoid arthritis according to Steinbrocker's criteria: 1—initial, 2—moderately advanced, 3—advanced, and 4—terminal (table 1). All the results were normal.



Glucose-insulin tolerance test in 17 cases of rheumatoid arthritis in various evolutive stages, by Engel and Scott's technique. Interrupted lines give the boundaries of normality. Left, cases 1 to 8. Right, cases 9 to 17.

TABLE 1.—*Results of Glucose-Insulin Test in Twelve Patients, by the Technique of Fraser and Co-Workers*

Case No.	Evolutive Stage *	Fasting Blood Sugar Level, Mg./100 Cc.	Serum Glucose Levels, Mg./100 Cc. No. of Min. After Administration of Glucose and Insulin 20	30	45	60	90	120	No. of Min. After Administration, with Addition of Epinephrine 165	180
1	2	95	115	110	130	130	125	120	150	145
2	2	90	120	140	140	...	145	100	125	90
3	2	90	140	170	180	190	135	130	130	150
4	1	90	110	110	105	125	101	90	115	130
5	3	105	115	145	170	165	95	95	175	135
6	3	90	125	145	190	190	180	160	175	155
7	2	85	135	125	130	115	115	120	180	170
8	2	90	95	100	130	140	125	100	165	170
9	3	115	240	160	195	240	215	145	160	185
10	2	95	95	115	150	155	125	80	140	150
11	3	90	105	120	150	140	130	155	180	175
12	2	80	55	55	70	80	105	95	155	155

* According to Steinbrocker's criteria: 1, initial; 2, moderately advanced; 3, advanced, and 4, terminal.

Technique of Engel and Scott.—After taking one blood sample in the fasting state we injected 0.1 unit of regular insulin per kilogram of body weight. Thirty minutes after (or before, if symptoms of hypoglycemic shock appear) a new blood sample is taken, and we administer 0.8 gm. of glucose orally per kilogram. New blood samples are taken 60, 90, 120, and 180 minutes from the beginning of the test. We studied 17 patients in various stages of the disease. The results, given in milligrams, are tabulated in table 2. The figure gives the findings in percentage of the initial blood sample that was considered as 100%. The results were normal in all instances. We wish to emphasize that the two groups on whom tests were done consisted of different patients.

TABLE 2.—*Results of Glucose-Insulin Test in Seventeen Patients, by the Technique of Engel and Scott*

Case No.	Evolutive Stage *	Fasting Blood Sugar Level, Mg./100 Cc.	Serum Glucose Levels, Mg./100 Cc. No. of Min. After Administration of Glucose and Insulin 30	60	90	120	180
1	3	106	73.2	108.0	108.0	209.0	118.0
2	3	110.3	58.5	110.3	106.8	110.0	65.5
3	3	96.5	90.5	124.0	151.0	160.0	140.0
4	3	77.0	56.6	89.0	190.2	213.7	.....
5	3	91.3	59.4	69.0	107.0	122.4	69.0
6	3	86.0	63.0	95.1	121.1	113.8	93.9
7	4	100.0	35.0	58.0	70.0	80.0	98.0
8	3	93.6	43.0	80.0	140.0	130.0	85.0
9	2	118.1	69.0	86.0	114.0	93.0	69.0
10	2	127.5	79.5	102.1	136.2	120.9	99.5
11	2	96.0	64.0	.....	125.5	168.6	122.4
12	1	100.0	65.0	124.0	174.0	96.0	86.0
13	1	111.2	35.7	113.0	142.0	96.0	86.0
14	1	149.1	48.8	69.6	132.7	130.6	103.7
15	1	110.0	90.0	109.0	182.7	163.7	155.7
16	3	82.0	40.0	174.0	187.0	146.0	112.0
17	3	105.0	60.0	68.0	110.0	108.0	90.0

* According to Steinbrocker's criteria: 1, initial; 2, moderately advanced; 3, advanced; and 4, terminal.

3. Hiller, E.: Störungen des Wasser- und Zuckerstoffwechsels als Ausdruck einer diencephalen Störung bei chronischer Polyarthritis, Ztschr. klin. Med. **146**: 569, 1950.

MEDICAL EDUCATION in the UNITED STATES and CANADA

FIFTY-FIFTH ANNUAL REPORT ON MEDICAL EDUCATION IN THE UNITED STATES AND CANADA BY THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS OF THE AMERICAN MEDICAL ASSOCIATION

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Acknowledgment

The material on the following pages constitutes the 55th annual report on "Medical Education in the United States and Canada," compiled by the Council on Medical Education and Hospitals. It includes data derived from official sources concerning schools of medicine and matters of information pertinent to medical education. The presentation of this information would not be possible without the full cooperation of medical school and university administrative officers, government officials, and many others. The Council on Medical Education and Hospitals wishes to express profound appreciation to the many individuals who have provided the information on which this current report is based.

Introduction

In the introduction to the comprehensive self-analysis of "Medical Schools in the United States at Mid-Century," Deitrick and Berson [1] indicate certain basic premises in their concern with the definition of a medical school and its responsibilities. These premises, involving fundamental principles in the education of a physician against which present-day medical education can be measured, are of interest and concern to all engaged in this important field of activity. Because the Council on Medical Education and Hospitals believes these principles to be of fundamental significance, they are referred to in this introductory statement for reflection and as a keynote in the study of the accompanying data on medical education.

First of all, "a medical school is held to be an educational institution concerned with a certain body of scientific and empiric knowledge, to which it should continue to make additions, and with which two individuals, the teacher and the student, must deal in order to understand and help a third person for the purpose of maintaining his health or overcoming his illness."

This necessitates the acceptance of two major responsibilities on the part of a medical school in the development of its educational program. The first of these is directed to its students and the second to society, through the individuals graduated as physicians. Because the medical school is the means of approach to a career in medicine, medical schools naturally are largely responsible for the medical profession. Because of this, the first and perhaps most important consideration of those vested with responsibility "is that the students must be the best human material that the faculty can select."

It is axiomatic that the medical student is the central factor in medical education and that all basic policies and activities be planned and conducted so as to create the best possible environmental circumstances and opportunities for him. The student entering upon the study of medicine has been molded by 20 years or so of development and education, and many of his acquired faults and weaknesses cannot be readily corrected by four years of medical education. The student's attitude and point of view and the level at which the medical school can initiate its educational program effectively are determined to a large extent by the type and quality of the preprofessional education he has experienced. Thus preprofessional education has become of increasing importance to medical educators and deserving of greater attention on their part in the continuing study of the background for medical education.

Data in table 20 are derived from table 2 of Stalnaker, J. M., and Dykman, R. A.: The Study of Applicants, Association of American Medical Colleges, to be published, and appears with permission of the authors.

1. Deitrick, J. E., and Berson, R. C.: Medical Schools in the United States at Mid-Century, New York, McGraw-Hill Book Company, Inc., 1953.

In the educational program in the medical school, there is no question but that the caliber of the faculty personnel and their attitude, sincerity of purpose, and interest in education are of greater importance than the exact manner of curriculum organization. The basic function of teaching and instructional methods, in addition to the acquisition of knowledge, lies in its potentiality to stimulate students to develop their own latent capacities and interests. Opportunities and experiences designed to stimulate the development of these student potentials should, therefore, be offered the student during his medical school exposure. Individuals entering the field of medicine today must develop a sound concept of the experimental method. They must develop an understanding of the principles and methods of the basic sciences so essential to comprehension of clinical medicine. During the undergraduate medical school experience, students must become familiar with sound methods of patient study under careful and critical supervision. It is imperative that those who teach in schools of medicine should be individuals who in their daily work, through precept and example, represent the highest concepts of ethics and professional care. This should begin with the very first contacts in medical school and must be fully as applicable in the basic medical sciences as in the undergraduate clinical fields of study and consistently encountered later through every phase of graduate and postgraduate medical education.

As far as the curriculum is concerned, it will be fully effective only if carefully designed for the benefit of the student and based on sound educational principles. A good curriculum is one that has been cooperatively designed by the faculty, which in turn is fully aware of the objectives and responsibilities of the institution. Such a curriculum will always be developed with the student as the key figure, incorporating the perspective and balance essential to attaining the objectives desired. A good curriculum cannot exist when there is lack of faculty understanding of program objectives or where there is a dearth of intercommunication and participation in its development.

By the time a student has completed his undergraduate medical program, he should possess a reasonable understanding of science, man, his health, diseases, and disabilities. He should have developed a genuine spirit of curiosity and be in possession of methods of study which foster the accumulation of facts and the making of observations that lead to new knowledge and the wisdom to utilize it. This should be only a healthy beginning, for, as Sherlock Holmes is supposed to have commented, "Like all other arts, the science of deduction and analysis is one that can only be acquired by long and patient study, nor is life long enough to allow any mortal to attain the highest possible perfections in it." However, during this period of study the medical student should have, as Deitrick and Berson state,[1] "experienced the satisfaction of facing, studying, understanding, and mastering by himself problems of science or of a patient's illness." If this has been the case, the foundation will be secure, basic medical education will have served its purpose, and the young physician will continue to gain the satisfactions emanating from continuous study, and constantly increasing knowledge and understanding.

It is important that medical education aid in developing competence, not only in individual endeavor but also in the concept of effective cooperation and teamwork. The tremendous advances of knowledge in the field of science and their application to medicine in recent years have augmented the necessity of cooperative teamwork as well as continuous education. The more firm the knowledge of basic sciences, the broader the factual information possessed, and the more intelligently physicians organize their knowledge, the greater the scientific service they can render their patients. In addition, however, every physician who deals with people must possess a genuine understanding of human beings and a sympathy for those aspects of medicine which transcend pure science. Here is where nothing can replace "precept and example" on the part of medical teachers and other members of the medical profession in helping to mold the student and young professional into the pattern of the true physician who can serve his fellow men best in their over-all needs.

As each school continuously reevaluates its own program, there is opportunity to determine how closely it comes to fulfilling the definition and function of a medical school as indicated by this midcentury concept.

Interesting and stimulating developments are constantly taking place in the field of medical education. In retrospect, the impression cannot be avoided that the increased interest in self-evaluation of curriculums, techniques, and methodology has been given great impetus as a result of the improved intercommunication of recent years. Undoubtedly, the increasing value of medical and other scientific society meetings during recent years has played an important role. However, the events that seem to have made the greatest immediate impact on the administrative officers and faculties of medical schools began with the Conference on Psychiatric Education [2] in 1951 held under the sponsorship of the American Psychiatric Association and the Association of American Medical Colleges. This stimulating and successful conference was followed by one on preventive medicine in medical schools [3] held at Colorado Springs in 1952 and cosponsored by the Conference of Professors of Preventive Medicine and the Association of American Medical Colleges. These conferences were made possible through generous support from organizations such as the Rockefeller Foundation, the Commonwealth Fund, the National Foundation for Infantile Paralysis, the John and Mary R. Markle Foundation, the National Tuberculosis Association, the Metropolitan Life Insurance Company, the Albert and Mary Lasker Foundation, the W. K. Kellogg Foundation, and the United States Public Health Service. Medical education owes these private and public agencies sincere appreciation for the encouragement, assistance, and support given during recent years that have made possible these valuable conferences and institutes.

2. Psychiatry and Medical Education: Report of the 1951 Conference on Psychiatric Education Held at Cornell University, Washington, D. C., American Psychiatric Association, 1952.

3. Preventive Medicine in Medical Schools: Report of Colorado Springs Conference: November 1952, J. M. Educ. **28**: 1-123 (Oct., pt. 2) 1953.

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These two background conferences were carefully planned to evaluate and compare what was being done by the various medical schools and to develop suggestions for improving methods of education in these areas. Those who attended these conferences carried their reactions over to the group attending the subsequent meetings of the Association of American Medical Colleges, as well as directly back to their respective faculty groups. The stimulating success of these initial conferences has been followed by the first two of a series of six annual teaching institutes that have been conducted by the Association of American Medical Colleges. The first of these was held at Atlantic City, N. J., in October, 1953, and covered the area of physiology, biochemistry, and pharmacology.[4] In October of 1954, the teaching institute covering the area of pathology, microbiology, immunology, and genetics was held at French Lick Springs, Ind.[5] The 1955 teaching institute to be held preceding the Association of American Medical Colleges meeting in October will cover the fields of anatomy, histology, embryology, and anthropology. Currently, the schedule calls for a 1956 teaching institute on medical ecology, 1957 teaching institute on clinical teaching, including the internship, and one on specialty training and the continuing education of the physician in 1958. It is to be anticipated that these institutes will continue to stimulate further and continuous curriculum modification, as well as enhance the effective utilization of successful educational experimentation, methods, and technics.

At the annual Congress on Medical Education and Licensure in February, 1955,[6] the Council on Medical Education and Hospitals conducted for the first time a full day conference dealing with a specific area of interest in postgraduate medical education. This conference was centered around "The Potential Use of Television in Postgraduate Medical Education." The morning session of the regular Council program dealt with a symposium on "Legal Medicine in Undergraduate Medical Education" and the afternoon session with a symposium on "The Future of the Internship."

In cooperation with the Federation of State Medical Boards of the United States, the Association of American Medical Colleges, and the American Hospital Association, the Council has been endeavoring to aid in the development of a more satisfactory means of evaluation of graduates of foreign medical schools. Numerous meetings have been conducted to date and suggested basic policies outlined. Currently, the study is still in progress. It is hoped that further progress toward a satisfactory solution to this problem will be continued during the years ahead, as the lack of such solution has significant potential impact on both medical education and licensure in this country and should be solved in the interest of public welfare and service.

The completion of the survey of postgraduate medical education in the United States and the publication of the series of articles in THE JOURNAL [7] covering its various aspects should be of interest to medical educators. This report indicates that medical school faculties are undoubtedly destined to play a role of increasing importance in this area of continuing medical education as time goes on. Medical schools might well be advised to take a careful look at their own past efforts in this area of medical education. It is important for medical educators to study and analyze such matters as the objectives and content, the best educational methods to utilize in this field, the most desirable time and place arrangements, sponsorship, financing, and challenges of postgraduate medical education. Its further development must be sound and rewarding to all who seek it. Its development must not interfere with, but should enhance, undergraduate medical education and research. Continuing medical education will need the careful thinking of medical educators and of the medical profession in cooperative planning towards the attainment of maximum value from time and effort invested on the part of both groups.

Medical Schools

APPROVED MEDICAL SCHOOLS

During 1954-1955, the University of California at Los Angeles completed the initial development of its four year undergraduate program in medicine and was granted full approval by the Council on Medical Education and Hospitals. It has also become a member of the Association of American Medical Colleges. There are now 75 approved four year schools of medicine and six approved schools of basic medical sciences, for a total of 81 approved institutions in the United States (table 1). Currently there are 11 approved four year medical schools and one approved school of basic medical science in Canada (table 2).

This year these tables on approved medical schools and schools of the basic medical sciences in the United States and in Canada have been modified and enlarged so as to include more summary data on each medical school. This has obviated the need for the annual reduplication of the short historical summary of the schools heretofore included at the end of the report. The current data includes the name of the school, its location, ownership, year of organization, current tuition, dates of next academic year, premedical years of study required, number of students by class, part-time and special students, number of graduates, and the executive officer of the institution. Data for the Canadian schools also includes the enrollment of students in the first and second premedical years, those in the fifth medical year, as well as those in a required intern year where indicated.

4. Association of American Medical Colleges: Report of the First Teaching Institute on Physiology, Biochemistry, and Pharmacology, 1953, J. M. Educ. **29**: 1-196 (July, pt. 2) 1954.

5. Association of American Medical Colleges: Report of the Second Teaching Institute on Pathology, Microbiology, Immunology and Genetics, 1954, J. M. Educ. **30**: 1-164 (Sept., pt. 2) 1955.

6. Proceedings of the Fifty-First Annual Congress on Medical Education and Licensure, 1955, Chicago, American Medical Association, to be published.

7. Vollan, D. D.: Scope and Extent of Postgraduate Medical Education in the United States, J. A. M. A. **157**: 703-708 (Feb. 26) 1955; The Physician as a Lifelong Student, ibid. **157**: 912-920 (March 12) 1955; Objectives and Content of Postgraduate Medical Education, ibid. **157**: 1119-1125 (March 26) 1955; Educational Methods in Postgraduate Teaching, ibid. **157**: 1302-1309 (April 9) 1955; Time and Place Arrangements of Postgraduate Courses for Practicing Physicians, ibid. **157**: 1492-1498 (April 23) 1955; Sponsorship and Administration of Postgraduate Medical Education, ibid. **158**: 39-43 (May 7) 1955; Financing Postgraduate Medical Education, ibid. **158**: 184-187 (May 21) 1955; Future of Postgraduate Medical Education, ibid. **158**: 395-399 (June 4) 1955.

TABLE 1.—*Approved Medical Schools and Schools of Basic Medical Sciences in the United States*

State	No.	Four Year Medical Schools *	Ownership †	Year Organized	Tuition: Resident	Tuition: Non-resident	1955-1956 Academic Year: Begins	1955-1956 Academic Year: Ends	Minimum Pre-medical Requirement by Years	Students by Classes, 1954-1955: 1st Yr.	2nd Yr.	3rd Yr.	4th Yr.	Total	Part-Time and Special Students ‡	Graduates 7-1-54 to 6-30-55	Marginal Number
Ala.	1	Medical College of Alabama, Birmingham	S	1943	$ 445	$ 695	9-14-55	5-27-56	3	82	74	74	80	310	4	80	1
Ark.	2	University of Arkansas School of Medicine, Little Rock	S	1879	380	...	9-12-55	6- 2-56	3	92	83	65	79	319	3	79	2
Calif.	3	College of Medical Evangelists, Loma Linda; Los Angeles	P	1909	1,292	1,292	8-31-55	6- 1-56	4	97	106	91	92	386	9	92	3
	4	University of Southern California School of Med., Los Angeles	P	1885	920	920	9-19-55	6- 9-56	3	69	68	70	68	275	0	75	4
	5	Stanford University School of Medicine, San Francisco	P	1908	870	870	9-26-55	6-13-56	3	60	58	64	60	242	0	116 §	5
	6	University of California School of Medicine, San Francisco	S	1864	334	584	9-12-55	6- 6-56	3	77	73	79	79	308	0	78	6
	7	University of California School of Medicine, Los Angeles	S	1951	167	292	9-12-55	6- 6-56	3	49	32	33	26	140	0	26	7
Colo.	8	University of Colorado School of Medicine, Denver	S	1883	665	2,665	9-26-55	6- 8-56	3	85	76	71	76	308	2	75	8
Conn.	9	Yale University School of Medicine, New Haven	P	1812	831	831	9-21-55	5-30-56	3	79	83	79	79	320	0	79	9
D. C.	10	Georgetown University School of Medicine, Washington	P	1851	960	960	9-12-55	5-19-56	4	108	117	113	110	448	0	110	10
	11	George Washington University School of Medicine, Washington	P	1825	850	850	9-19-55	6- 6-56	3	102	92	88	80	362	0	80	11
	12	Howard University College of Medicine, Washington	P	1869	611.75	611.75	9-19-55	6- 8-56	3	73	73	61	70	277	6	75	12
Ga.	13	Emory University School of Medicine, Emory University	P	1854	800	800	9-15-55	6- 8-56	3	75	71	72	69	287	1	69	13
	14	Medical College of Georgia, Augusta	S	1828	390	690	9-15-55	6- 2-56	3	101	87	71	77	336	7	76	14
Ill.	15	Chicago Medical School, Chicago	P	1912	664	664	10- 3-55	6-16-56	4	73	71	73	64	281	0	63	15
	16	Northwestern University Medical School, Chicago	P	1859	930	930	9-28-55	6-15-56	3	130	124	139	139	532	1	138	16
	17	Stritch School of Medicine of Loyola University, Chicago	P	1915	675	675	9-26-55	6-16-56	3	89	81	84	79	333	0	79	17
	18	University of Chicago, The School of Medicine, Chicago	P	1924	900	900	9-28-55	6- 8-56	3	72	65	74	67	278	0	67	18
	19	University of Illinois College of Medicine, Chicago	S	1882	295.50	583.50	9-26-55	6-15-56	3	166	158	163	169	656	0	170	19
Ind.	20	Indiana University School of Medicine, Bloomington; Indianapolis	S	1903	320	600	9-19-55	6- 5-56	3	154	150	142	134	580	2	131	20
Iowa	21	State University of Iowa College of Medicine, Iowa City	S	1869	304	614	9-22-55	6- 8-56	3	120	113	116	107	456	1	107	21
Kan.	22	University of Kansas School of Medicine, Lawrence; Kansas City	S	1880	480	930	9- 8-55	5-31-56	4	102	104	120	123	449	0	121	22
Ky.	23	University of Louisville School of Medicine, Louisville	M	1837	800	1,200	9-12-55	6- 2-56	3	100	94	96	91	381	0	91	23
La.	24	Louisiana State University School of Medicine, New Orleans	S	1931	120	520	9- 6-55	6- 2-56	3	126	101	97	118	442	4	118	24
	25	Tulane University of Louisiana School of Medicine, New Orleans	P	1834	800	800	9-12-55	5-28-56	3	137	121	126	131	515	0	129	25
Md.	26	Johns Hopkins University School of Medicine, Baltimore	P	1893	939.20	939.20	10- 3-55	6-12-56	4	80	65	70	73	288	0	73	26
	27	University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore	S	1807	535	785	9-22-55	6- 9-56	3	88	95	100	100	383	0	100	27
Mass.	28	Boston University School of Medicine, Boston	P	1873	875	875	9-12-55	5-26-56	3	75	69	75	77	296	0	76	28
	29	Harvard Medical School, Boston	P	1782	1,055	1,055	9-23-55	6-14-56	2	115	114	153	140	522	0	139	29
	30	Tufts College Medical School, Boston	P	1893	865	865	9-21-55	6-11-56	3	112	112	112	110	446	0	110	30
Mich.	31	University of Michigan Medical School, Ann Arbor	S	1850	400	700	9-26-55	6-16-56	3	205	183	197	176	761	1	173	31
	32	Wayne University College of Medicine, Detroit	M	1885	537	...	9-12-55	6- 9-56	3	75	70	62	68	275	0	67	32
Minn.	33	University of Minnesota Medical School, Minneapolis	S	1883	361.50	700	9-26-55	7-15-56	3	127	115	120	116	478	0	116	Harold S. Diehl, M.D., Dean of Medical Sciences 33
Mo.	34	St. Louis University School of Medicine, St. Louis	P	1901	900	900	9-13-55	6- 1-56	3	125	122	115	117	479	14	116	34
	35	Washington University School of Medicine, St. Louis	P	1842	906	906	9-12-55	6- 2-56	3	87	84	97	99	367	0	97	35
Neb.	36	Creighton University School of Medicine, Omaha	P	1892	812	812	9-19-55	6- 2-56	3	76	76	78	80	310	0	79	36
	37	University of Nebraska College of Medicine, Omaha	S	1881	450	615	9-21-55	6-16-56	3	86	81	83	83	333	1	81	37
N. Y.	38	Albany Medical College, Albany	P	1838	1,007	1,007	9- 6-55	5-26-56	3	64	51	49	51	215	0	51	38
	39	University of Buffalo School of Medicine, Buffalo	P	1847	876	876	9-19-55	6- 9-56	4	80	72	61	71	284	1	70	Stockton Kimball, M.D., Dean 39
	40	Columbia University College of Physicians and Surgeons, New York City	P	1767	900	900	9-12-55	5-31-56	3	120	115	118	113	466	0	113	Willard C. Rappleye, M.D., Dean 40

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	41	Cornell University Medical College, New York City	P	1898	900	900	9-15-55	6- 6-56	3	83	83	87	85	338	0	85	E. Hugh Luckey, M.D., Dean	41
	42	New York Medical College, Flower and Fifth Avenue Hospitals, New York City	P	1858	896	896	9-12-55	5-26-56	3	128	128	109	116	481	0	116	Ralph E. Snyder, M.D., Exec. Dean	42
	43	New York University College of Medicine, New York City	P	1841	917	917	9-12-55	5-19-56	3	137	126	142	135	540	0	135	Donal Sheehan, M.D., Dean	43
	44	State University of New York College of Med., New York City	S	1858	715	715	9-19-55	6- 9-56	3	151	152	148	138	589	3	138	Howard Potter, M.D., Dean	44
	45	State University of New York College of Medicine, Syracuse	S	1872	715	715	9-12-55	6- 9-56	3	76	67	70	71	284	0	71	William R. Willard, M.D., Dean	45
	46	Univ. of Rochester School of Medicine and Dentistry, Rochester	P	1925	800	800	9-12-55	6-10-56	3	72	69	65	68	274	1	67	Donald G. Anderson, M.D., Dean	46
N. C.	47	Duke University School of Medicine, Durham	P	1930	900	900	10- 3-55	6- 9-56	3	77	76	80	78	311	0	77	Wilburt C. Davison, M.D., Dean	47
	48	Bowman Gray School of Medicine of Wake Forest College, Winston-Salem	P	1902	750	750	10- 3-55	6- 9-56	3	54	52	47	51	204	0	51	C. C. Carpenter, M.D., Dean	48
	49	University of North Carolina School of Medicine, Chapel Hill	S	1890	670.50	1,270.50	9-13-55	6- 4-56	3	66	58	58	59	241	0	59	W. Reece Berryhill, M.D., Dean	49
Ohio	50	University of Cincinnati College of Medicine, Cincinnati	M	1819	616.75	741.75	9-26-55	6- 2-56	3	90	80	85	90	345	0	89	Stanley E. Dorst, M.D., Dean	50
	51	Western Reserve University School of Medicine, Cleveland	P	1843	800	800	9-21-55	6-15-56	3	84	77	78	87	326	1	86	Joseph T. Wearn, M.D., Dean	51
	52	Ohio State University College of Medicine, Columbus	S	1914	525	780	9-27-55	6- 8-56	3	150	137	143	137	567	0	136	Charles A. Doan, M.D., Dean	52
Okla.	53	University of Oklahoma School of Medicine, Oklahoma City	S	1900	200	400	9-12-55	5-19-56	3	96	94	98	100	388	0	100	Mark R. Everett, Ph.D., Dean	53
Ore.	54	University of Oregon Medical School, Portland	S	1887	471	651	10- 3-55	6-15-56	3	78	66	75	80	299	21	77	D. W. E. Baird, M.D., Dean	54
Pa.	55	Hahnemann Medical College and Hospital of Philadelphia, Philadelphia	P	1848	847	847	9-12-55	6- 9-56	3	107	99	95	92	393	0	92	Harold A. Taggart, M.D., Acting Dean	55
	56	Jefferson Medical College of Philadelphia, Philadelphia	P	1825	800	800	9-12-55	6-13-56	3	175	166	172	169	682	0	169	George Allen Bennett, M.D., Dean	56
	57	Temple University School of Medicine, Philadelphia	P	1901	810	810	9- 6-55	6-14-56	3	131	113	127	126	497	1	125	William N. Parkinson, M.D., Vice President and Dean	57
	58	University of Pennsylvania School of Medicine, Philadelphia	P	1765	950	950	9- 6-55	6-13-56	4	130	119	126	130	505	0	130	John McK. Mitchell, M.D., Dean	58
	59	Woman's Medical College of Pennsylvania, Philadelphia	P	1850	860	860	9-12-55	6- 9-56	3	51	49	41	40	181	0	40	Marion Fay, Ph.D., Dean	59
	60	University of Pittsburgh School of Medicine, Pittsburgh	P	1886	800	800	9-12-55	6- 9-56	3	100	93	87	97	377	2	96	William S. McElroy, M.D., Dean	60
S. C.	61	Medical College of South Carolina, Charleston	S	1823	437.50	1,537.50	9- 8-55	6- 7-56	3	79	80	67	67	293	0	66	John T. Cuttino, M.D., Dean	61
Tenn.	62	University of Tennessee College of Medicine, Memphis	S	1876	450	675	7- 7-55	6-13-56	3	221	194	204	185	804	14	188	O. W. Hyman, Ph.D., Vice President and Dean	62
	63	Meharry Medical College, Nashville	P	1876	640	640	9-19-55	5-30-56	3	72	59	66	63	260	0	62	Daniel T. Rolfe, M.D., Dean	63
	64	Vanderbilt University School of Medicine, Nashville	P	1874	810	810	9-26-55	6- 3-56	3	53	51	52	47	203	1	48	John B. Youmans, M.D., Dean	64
Texas	65	University of Texas Southwestern Medical School, Dallas	S	1943	110	...	9-13-55	6- 2-56	3	108	90	101	101	400	11	100	A. J. Gill, M.D., Asst. Dean	65
	66	University of Texas School of Medicine, Galveston	S	1890	92	342	9-12-55	6- 2-56	3	172	146	154	150	622	0	148	T. G. Blocker, Jr., M.D., Acting Chairman, Interim Exec. Comm.	66
	67	Baylor University College of Medicine, Houston	P	1900	790	790	9-12-55	5-28-56	3	85	97	79	92	353	5	92	Stanley Olson, M.D., Dean	67
Utah	68	University of Utah School of Medicine, Salt Lake City	S	1905	480	880	9-26-55	6-22-56	3	56	53	48	53	210	4	53	Philip B. Price, M.D., Acting Dean	68
Vt.	69	University of Vermont College of Medicine, Burlington	S	1822	576	1,026	9- 9-55	6-10-56	4	52	47	45	47	191	1	46	George A. Wolf, M.D., Dean	69
Va.	70	University of Virginia School of Medicine, Charlottesville	S	1827	464	864	9-19-55	6-11-56	3	76	70	65	64	284	0	63	Thomas Harrison Hunter, M.D., Dean	70
	71	Medical College of Virginia, Richmond	S	1838	566	891	9- 8-55	5-29-56	3	84	77	106	100	367	0	100	John B. Truslow, M.D., Dean	71
Wash.	72	University of Washington School of Medicine, Seattle	S	1945	390	585	9-28-55	6- 3-56	3	76	69	71	70	286	3	70	George N. Aagaard, M.D., Dean	72
Wis.	73	University of Wisconsin Medical School, Madison	S	1907	340	660	9-19-55	6-11-56	3	82	83	79	75	319	1	75	John Z. Bowers, M.D., Dean	73
	74	Marquette University School of Medicine, Milwaukee	P	1912	850	850	9-12-55	6- 1-56	3	103	101	93	100	397	9	100	John S. Hirschboeck, M.D., Dean	74
P. R.	75	University of Puerto Rico School of Medicine, San Juan	S	1949	539	539	8-13-55	5-19-56	3	52	46	43	42	183	1	42	E. Harold Hinman, M.D., Dean	75
		Totals								7,340	6,875	6,957	6,946	28,118	136	6,977		
		Schools of Basic Medical Sciences																
Miss.	1	University of Mississippi School of Medicine, University	S	1903	416.50	...	9- 6-55	6- 1-56	3	56	58	..	..	114	0	..	David S. Pankratz, M.D., Dean	1
Mo.	2	University of Missouri School of Medicine, Columbia	S	1845	284	...	9-14-55	6- 6-56	3	45	48	..	..	93	0	..	Roscoe L. Pullen, M.D., Dean	2
N. H.	3	Dartmouth Medical School, Hanover	P	1797	800	800	9-19-55	6-10-56	3	24	23	..	..	47	0	..	Rolf C. Syvertsen, M.D., Dean	3
N. Dak.	4	University of North Dakota School of Medicine, Grand Forks	S	1905	138.50	223.50	9- 6-55	6- 2-56	3	42	42	..	..	84	2	..	Theodore H. Harwood, M.D., Dean	4
S. Dak.	5	Univ. of South Dakota School of Medical Sciences, Vermillion	S	1907	270	480	8-29-55	6- 4-56	3	37	26	..	..	63	4	..	W. L. Hard, Ph.D., Dean	5
W. Va.	6	West Virginia University School of Medicine, Morgantown	S	1942	258	700	9-16-55	5- 4-56	3	32	32	..	..	64	0	..	Edward J. Van Liere, M.D., Dean	6
		Totals								236	229	..	..	465	6	..		
		Grand Totals (Four Year Schools and Schools of Basic Medical Sciences)								7,576	7,104	6,957	6,946	28,583	142	6,977		

* During the year of this report, the University of Miami School of Medicine, Coral Gables, Fla., had only the first three classes in attendance. Since medical schools are not eligible for full Council approval until all four years are in operation, students enrolled at Miami in 1954-1955 (first year class—69, second year—36, third year—26, total—131) are not included in this and following tables.

† S = state, P = private, M = municipal.

‡ Data for total enrollment in previous years in table 11 include only full-time students.

§ Two classes.

Table 3 summarizes the development and growth of approved medical schools in the United States during the period 1910-1955. It clearly portrays the growth from 66 approved schools graduating 3,165 physicians in 1910 to the present 81 graduating 6,977 in the spring of 1955. The growth of student enrollment in approved schools from 12,530 in 1910 to 28,583 in 1955 has been in keeping with the population growth of the nation during this period and indicates, furthermore, that not only have new schools developed but many older institutions have augmented their facilities so as to educate larger numbers of students as the demand has arisen.

According to classification by ownership, there are now in the United States 41 privately owned, 37 state, and 3 municipal medical schools (table 1).

The relatively rapid turnover of medical school administrative personnel that has occurred during recent years continued during 1954-1955 with the appointment or pending appointment of new executive officers in 11 approved medical schools in the United States. Ten such changes were made in 1953-1954. Institutions which made new administrative personnel adjustments in 1954-1955 include the University of Arkansas, College of Medical Evangelists, Howard University, Chicago Medical School, the University of Maryland, Boston University, New York University, Hahnemann Medical College, University of Texas (Galveston Branch), the University of Utah, and the University of Wisconsin.

TABLE 2.—*Approved Medical Schools and Approved*

Medical Schools		Year Organized	Tuition		1955-1956 Academic Year		Minimum Premedical Requirement by Years
			Resident	Nonresident	Begins	Ends	
Alta.	1 University of Alberta Faculty of Medicine, Edmonton	1913	$300	$300	9- 6-55	4-30-56	3
B. C.	2 University of British Columbia School of Medicine, Vancouver	1949	445	445	9- 6-55	5-12-56	3
Man.	3 University of Manitoba Faculty of Medicine, Winnipeg	1883	451	456	9-12-55	5-19-56	3
N. S.	4 Dalhousie University Faculty of Medicine, Halifax	1867	434	...	9- 6-55	5-17-56	3
Ont.	5 Queen's University Faculty of Medicine, Kingston	1854	469.80	469.80	9-12-55	5- 9-56	2
	6 University of Ottawa Faculty of Medicine, Ottawa	1945	419	719	9- 7-55	6- 1-56	Degree
	7 University of Western Ontario Faculty of Medicine, London	1881	550	550	9-12-55	5-19-56	3
	8 University of Toronto Faculty of Medicine, Toronto	1843	541	541	9-19-55	5-12-56	2
Que.	9 McGill University Faculty of Medicine, Montreal	1823	593	593	9- 7-55	6- 2-56	3
	10 University of Montreal Faculty of Medicine, Montreal	1843	390	465	9-13-55	5-25-56	Degree
	11 Laval University Faculty of Medicine, Quebec	1848	400	600	9- 7-55	6- 1-56	Degree
	Totals	....	...	...	.....	.....	..
School of Basic Medical Sciences							
Sask.	1 University of Saskatchewan College of Medicine, Saskatoon	1926	380.50	380.50	9-21-55	6- 9-56	2
	Grand Totals	....	...	...	.....	.....	..

* Intern and premedical figures not included.

NEWLY DEVELOPING MEDICAL SCHOOLS

Table 4 lists the four completely new four year medical schools and the three formerly two year basic medical science schools extending their programs to four year curriculums, that are currently in various stages of development. The table indicates whether a program is entirely new or extended and lists the estimated year of graduation of its first class of physicians. By 1960, therefore, there should be 82 four year medical schools and 3 two year schools of the basic medical sciences in the United States, if these currently developing programs are completed on schedule.

At the University of Miami School of Medicine the outpatient clinic building has been constructed on the grounds of the Jackson Memorial Hospital. It was scheduled for occupancy and activities in June, 1955, and will be the location of the major portion of the fourth year teaching program. Architectural working plans for the basic science building to be erected at the Jackson Memorial Hospital site have been completed. In the meantime, basic science teaching and research activities continue in the building occupied in Coral Gables. Further faculty and curriculum developments have taken place, and the first class is scheduled to complete the undergraduate medical course in June, 1956. A liaison survey visit will be conducted during November, as the school enters its full four year program.

The University of Mississippi School of Medicine has completed its 9 million dollar construction. Faculty development and curriculum planning for the clinical years are well along. As has been the experience in relation to other developmental programs in some of the medical schools of state universities, difficulties have arisen in connection with the establishment of policies regarding employment of clinical faculty personnel. It is to be hoped that this problem has been adjusted on the local level to the mutual satisfaction of the university, the school of medicine, and the medical profession.

At the University of Missouri, all of the primary construction planned for its four year medical school is under way. The 450-bed teaching hospital and outpatient departments are close to completion. Major structural elements of the new Medical Sciences Building are in place, and the building is scheduled for occupancy at the end of the 1955-1956 academic year. Construction is also progressing on the new nursing home. Staffing of the new medical school's faculty is well advanced. The third year curriculum has been established, and the first third year class will initiate its studies in September, 1955, with the first group of candidates for degrees scheduled for graduation in June, 1957.

Construction on the $10,695,000 Basic Sciences Building at the West Virginia University School of Medi-

cine has been initiated. At the time of this report, the basic steel construction has been completed.

The Albert Einstein College of Medicine of Yeshiva University is far advanced in its faculty organization and construction program. The new Nathan B. Van Etten and Abraham Jacobi Hospital units are completed and in operation. The first unit of the medical college building under construction adjacent to the hospital site is nearing completion and will be ready for occupancy late in the summer of 1955. The basic curriculum planning has been completed, and the first class has been selected to initiate its studies during the academic year 1955-1956.

Seton Hall College of Medicine is now being developed at the Jersey City Medical Center. The university has consummated a 50 year contract with the city administration that permits the new schools of medicine and dentistry to occupy the 16 story former outpatient building of the Jersey City Medical Center. This building is being remodeled to meet the needs of the two new professional schools for teaching, research, library, and certain clinic accommodations. Under the current agreement the city rents this building to the university and a mutually satisfactory program of maintenance has been consummated. At the present time, faculty organization, curriculum planning, and reconstruction activities are under way. It is anticipated that the program development will make it possible to graduate the first class of physicians in 1960.

The developmental program at the University of Florida School of Medicine at Gainesville is well under way. Building construction has been initiated for the Medical Sciences Building which will include both basic science and clinical wings, library, and auditorium. The completed center will include a hospital unit of about 350 beds for patients with acute conditions, an ambulant patient facility with 50 beds, and clinic facilities. Faculty organization and further curriculum planning are currently being developed. It is anticipated that the first class of students will be candidates for degrees in the spring of 1960.

In last year's Education Number of THE JOURNAL it was reported that the University of Kentucky's board of trustees had formally sanctioned the establishment of a medical school in Lexington and that funds were to be sought from the Kentucky General Assembly. The Kentucky Medical Sciences Development Foundation was created to promote interest in the project and to receive funds from private sources as well as to file articles of incorporation and formulate building plans tentatively for July 1, 1955. At the present time, the foundation is conducting a program of public information as to the medical needs within the state. It was also reported last year that the North Dakota legislature had directed its School of Medicine to admit a third year class by 1955 and that a full four year program be in operation by 1956. Currently this development is being held in abeyance.

There has been consideration of the possibility of the development of a medical school at Hartford, Conn., as a unit of the University of Connecticut. In 1953 a commission was authorized by the state legislature to study the feasibility of such a development. Subsequently the commission reported favorably on the project and also recommended that the state of Connecticut participate in the New England Regional Compact for Higher Education, including medicine. The commission recom-

School of Basic Medical Sciences in Canada

Students by Classes, 1954-1955											
First Pre-medical Year	Second Pre-medical Year	1st Year	2nd Year	3rd Year	4th Year	Additional Year	Required Intern Year	Total	Part-Time and Special Students	Graduates 7-1-54 to 6-30-55	
..	..	60	56	58	56	..	..	230	0	57	John W. Scott, M.D., Dean..... 1
..	..	58	53	61	59	..	..	231	0	58	Myron M. Weaver, M.D., Dean..... 2
..	..	69	52	67	64	..	100	252 *	0	76	Lennox G. Bell, M.D., Dean..... 3
..	..	58	57	61	53	..	48	229*	0	48	C. B. Stewart, M.B., Dean..... 4
64	..	63	53	60	60	55	..	291 *	0	55	G. Harold Ettinger, M.D., Dean..... 5
34	..	64	57	32	47	..	46	200 *	0	48	A. L. Richard, M.D., Dean..... 6
..	..	61	58	58	60	..	..	237	1	60	J. B. Collip, M.D., Dean..... 7
130	137	131	146	154	152	..	..	583 *	0	155	J. A. MacFarlane, M.B., Dean..... 8
..	..	117	96	108	112	..	..	433	0	112	G. Lyman Duff, M.D., Dean..... 9
..	..	118	108	102	95	..	99	423*	0	94	Wilbrod Bonin, M.D., Dean..... 10
121	..	129	135	120	79	..	135	463*	0	134	Jean-Baptiste Jobin, M.D., Dean..... 11
349	137	928	871	881	837	55	428	3,572	1	894	
..	..	40	32	..	..	..	..	72	0	..	J. Wendell Macleod, M.D., Dean..... 1
349	137	968	903	881	837	55	428	3,644	1	894	

TABLE 3.—*Schools, Students, and Graduates in Medicine, 1910-1955*

	Rating of Schools			Student Enrollment			Physicians Graduated		
	Approved		Unapproved	Approved		Unapproved	Approved		Unapproved
Yr.	A	B	C	A	B	C	A	B	C
1910	66	43	22	12,530	6,944	2,052	3,365	854	421
1915	67	22	15	11,314	2,688	909	2,029	688	219
1920	70	10	8	12,559	731	708	2,680	102	205
1925	71	3	6	17,462	554	184	3,842	118	14
1930	76	..	..	21,597	...	...	4,565	...	...
1935	77	..	..	22,888	...	...	5,101	...	...
1940	77	..	..	21,271	...	...	5,097	...	...
1945	77	..	..	24,028	...	...	5,136	...	...
1950	79	..	..	25,103	...	...	5,553	...	...
1955	81	..	..	28,583	...	...	6,977	...	...

mended that the trustees of the University of Connecticut be directed to proceed forthwith in the development of the medical school and asked for a special bond issue of 6 million dollars for primary financing. Later study resulted in the introduction of a substitute measure directing the appointment of a new commission, including members of the board of trustees of the University of Connecticut, to proceed with preliminary planning for a medical school, site determination, and appropriation of $50,000 for initial costs. Since the recent Connecticut legislature adjourned prior to consideration of this bill, no further action will take place until the next biennium unless a special session shall be called.

A year ago, some consideration was being given to the establishment of a medical school in Toledo, Ohio. At the present time there is no indication that such a development may occur in the immediate future.

The Massachusetts House has rejected legislation calling for the establishment of medical and dental schools at the University of Massachusetts. Massachusetts has joined in a five state pact which may eventually evolve into the establishment of a regional medical school.

TABLE 4.—*Medical Schools Currently Developing Four Year Programs*

Name of Institution	New or Extended Development	Estimated Graduation Date of First Class
University of Miami School of Medicine.....	Completely new school	1956
University of Mississippi School of Medicine.....	Formerly two year school	1957
University of Missouri School of Medicine.....	Formerly two year school	1957
West Virginia University School of Medicine.....	Formerly two year school	1958-1959
Albert Einstein College of Medicine.....	Completely new school	1959
Seton Hall College of Medicine and Dentistry..	Completely new school	1960
University of Florida School of Medicine.....	Completely new school	1960

From various quarters there is constant representation of increased needs for medical personnel. Needs for additional facilities for the education of physicians are exceedingly difficult to determine and require careful analysis of who represents what need. No one will deny the fact that, with a constantly growing population and with the ever-increasing health consciousness of the nation, there will be a constant and continuous demand for increased numbers of medical personnel and that this will necessitate new medical schools and possible augmentation of the facilities and faculty personnel of those now in existence. The many areas such as medical administration, teaching, research, military services, veterans administration, and public health services unquestionably remove many physicians from active private medical practice today. On the other hand, there are now large numbers of personnel trained and employed in ancillary fields supporting and assisting in certain aspects of diagnosis and medical care under medical supervision. Needs are presented and interpreted differently by different groups. Some indicate needs primarily in terms of distribution of personnel, others in terms of the type of training, experience, or service considered to be desirable, while others simply echo the idea of need with no indication of just what the need is except for vague concepts.

Increased knowledge and its utilization with the associated rapid expansion of specialization accompanied by demands for personnel in these fields have materially changed the over-all practice of medicine in recent years. Social readjustments are also making their impact on the practice of medicine. These readjustments have been relatively abrupt, and neither the general public nor the profession have become fully adjusted to them. The estimates of need for medical personnel have been reported in such studies as America's Resources of Specialized Talent,[8] which constitutes the Report of the Commission on Human Resources and Advanced Training. The figures on needs in medicine in this report are largely drawn from the report of the President's Commission on the Health Needs of the Nation[9] and the Health Manpower Source Book, Section I, issued by the Federal Security Agency.[10] Probably no analytical reports of estimated requirements that have been developed in this rapidly changing scene can accurately represent more than the existence of felt needs in some areas.

It appears, therefore, that one of the constant challenges confronting medical educators and all those interested in and concerned with medical teaching, research, and the provision of adequate medical care involves efforts to evaluate effectively current and projected needs for personnel in this field and the facilities, faculty personnel, and financing essential to their development. The new medical schools currently undergoing development will aid in meeting increasing needs for medical personnel in the years immediately ahead. What adjustments are needed, either in augmentation of student capacity of existing medical schools or in the development of new medical schools during the next quarter of a century? It is apparent that anything in the way of a reasonable forecast for even 10 years ahead involves a constant study and analysis of the whole social structure of the nation today in an effort to meet the needs for personnel in the varied and increasingly complex period that confronts it. The number of professionally trained personnel desirable in any area of human endeavor is not as simple as a ratio of such personnel per unit of population. It is far more dependent on the existing knowledge in any given area and the application of such knowledge to human activity in all phases. The field of medicine, because of its important role in human welfare and happiness and its direct implications in all other areas of activity, will continue to present demands for personnel augmentation in keeping with population growth and other factors. With the financing of medical education as difficult and precarious as it has been in recent years, it is of paramount impor-

8. Commission on Human Resources and Advanced Training: America's Resources of Specialized Talent, New York, Harper & Brothers, 1954, p. 332.

9. Building America's Health, Report to the President by the President's Commission on the Health Needs of the Nation: vol. 1, Findings and Recommendations, U. S. Government Printing Office, 1954, p. 13.

10. Pennell, M. Y., and Altenderfer, M. E.: Health Manpower Source Book [illegible], Physicians, Federal Security Agency, United States Public Health Service, 1952.

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tance that continued effort be made to stabilize more effectively existing programs and to aid in clearly forecasting the implications in terms of facilities, faculty, and financing of any new programs which may develop.

DEVELOPMENTS OF INTEREST IN MEDICAL SCHOOLS, 1954-1955

In their annual reports to the Council, many of the medical schools indicate major developments in one or several aspects of their programs. These involve changes in curriculum, altered or new approaches to certain aspects of undergraduate or graduate medical education, and readjustments in financing. There continues to be deep interest in curriculum modifications in keeping with the changing emphases on various aspects of medical education. The following material has been selected from the annual reports as illustrative of the continued dynamic thinking and action generally apparent in medical schools throughout the nation.

At the Stanford University School of Medicine, curriculum studies are being conducted in relation to the ultimate transfer of the clinical years of study from the San Francisco site to the Stanford campus. A trial run has been made at integrating courses of the second year in the spring quarter of 1954-1955 and continuing the plan for the next year. Similar basic planning is being conducted at the Indiana University School of Medicine and at the University of California (Berkeley-San Francisco) in view of the impending transfers of their first year programs to the main medical school campuses. On completion of the plans currently under way in these three schools, they will each have opportunity for the development of maximum cooperation and integration between basic medical sciences and the clinical areas which have been difficult to achieve with divided medical campuses.

On Oct. 1, 1954, the School of Medicine of the University of Miami assumed control of the professional and instructional activities of the Jackson Memorial Hospital in accord with earlier agreements made by the University, the Dade County Commissioners, and the Dade County Medical Society. A medical board has been established with representation from the faculty, the hospital administration, and the courtesy staff with the dean of the School of Medicine as its chairman.

The third and fourth year curriculums of the Medical College of Georgia has been reorganized on the "block" system. In the third year, medicine and surgery have each been allocated 12 weeks, with obstetrics-gynecology and pediatrics each being assigned 6 weeks. In the fourth year, medicine is assigned 12 weeks, of which 6 weeks will be spent in domiciliary medicine, with surgery, obstetrics-gynecology, pediatrics, and electives each having a 6 weeks' assignment. Faculty reorganization on a strict full-time basis has been initiated.

Emory University School of Medicine reports that an anonymous gift to the university has been made to underwrite the minimum budget of the institution and to stabilize its basic financing. At Emory, the division of basic sciences in the health services is now responsible for instruction in the schools of medicine, dentistry, nursing, and pharmacy, as well as in the graduate school of the university. This division is administered with an understanding of its full responsibilities to students and faculties in each of these fields, and close administrative and functional liaison is maintained with them. There are now 25 members of the clinical faculty in the partnership arrangements associated with the development of the Emory University clinic. The university believes that this clinic program as it is now developing will enhance teaching, research, and service, as well as certain aspects of financing.

At the Indiana University School of Medicine, as previously indicated, studies are being made on the integration of teaching in the basic science departments in anticipation of the transfer of the first year of instruction from Bloomington to the Indianapolis campus. Greater emphasis is being given also to improved opportunities for graduate education as new facilities are made available.

A "Senior Day" under sponsorship of the Kentucky State Medical Association was inaugurated at the University of Louisville School of Medicine on April 18, 1955. The trustees of the university have authorized the expansion of the first year class from 100 to 124 students, limiting the additional places to Kentucky residents if a sufficient number qualify.

Curriculum changes now under way at the University of Maryland will place all anatomy in the first semester of the first year. Correlation between departments is being promoted. Augmentation of financial support has provided for salary increases in the basic sciences and some adjustments in the clinical area. Provision has been made for the engagement of additional full-time and part-time faculty personnel.

Boston University School of Medicine has reorganized the third year curriculum to provide for a decrease in the number of hours devoted to lectures and increased time in the clinics, allowing more free time for elective work and establishing an improved examination schedule. The teaching of physical medicine has been incorporated into the third year program.

At Tufts College Medical School, the general medical, pediatric, psychiatric, and children's psychiatric clinics are cooperating in an effort to provide students with a realistic experience in ambulatory medicine and home care. The program is designed to permit continuity of observation of patients. The student will see a patient, adult or child, for the first time in the home and send him to the "office" (student assigned area) in the Boston dispensary if further study or follow-up is indicated or follow a patient from the "office" to the home. The same instructors will supervise the student's work both in the outpatient department and on the home service. The faculty believes that a two month period should permit the student to follow an acute illness from onset to recovery and to obtain a fair appreciation of the course and problems of chronic illness. On his "office" days the student will also actually work with any of his patients referred to the Rehabilitation Institute of the New England Medical Center. If hospitalization is required, the student will follow his patient to the ward. The objective of the program is to provide a basic orientation for family practice.

During the past year, physical diagnosis at the Creighton University School of Medicine has been taught as an interdepartmental project in the second year. The course is now designated as "Clinical Diagnosis." Some aspects of histology formerly taught in the department of anatomy have been integrated into the course in pathology. Material reduction of didactic assignments in the third and fourth years have facilitated the establishment of more effective clinical clerkships.

Albany Medical College reports continuation study by the committee charged to survey and plan for curriculum improvements. Although no major alterations have been recommended to date, there has been a reduction of departmental lectures in favor of interdepartmental "panel" instruction with emphasis on more active student participation. This has been associated with greater inclusion of basic science faculty members as participants in the panels. A series of applied basic science clinics has been introduced into the first year curriculum and is reported to have been enthusiastically received by both students and staff. Albany Medical College has taken increased interest in the field of continuing medical education. During the 1954-1955 period, the postgraduate medical education program was expanded and well received. New approaches to postgraduate medical teaching are currently being developed.

TABLE 5.—*Cost of Completed and Estimated Cost of Initiated Construction and Equipment in Medical Schools, 1954-1955*

Purpose	Schools in United States				Schools in Canada	
	No. Completed	Cost	No. Initiated	Cost	No. Initiated	Cost
Basic medical sciences teaching and research..	15	$46,981,000	15	$60,330,029	2	$2,100,000
Hospital and clinic teaching and research..	13	47,957,000	6	19,395,000	1	1,500,000
Dormitory	3	4,446,986	1	1,246,259	..	.....
Totals		$99,384,986		$80,971,288		$3,600,000

The State University of New York College of Medicine at Syracuse reports the establishment of a student honor system during 1954-1955. Student participation on some faculty committees has been developed.

At the University of Oklahoma School of Medicine, a nucleus of full-time psychiatrists has been appointed to develop the teaching program in this field. Cooperatively the departments of anatomy, medicine, psychiatry, and pediatrics have developed a first year course in normal growth and development. A department of physical medicine has been developed under full-time leadership and a school of physical therapy established. Industrial medicine now is organized and taught by a full-time member of the staff of the department of preventive medicine.

Additional support from the M. D. Anderson Foundation has made it possible for the Baylor University College of Medicine to develop an enlarged program in psychiatry at both undergraduate and residency training levels. A program of research with emphasis on the pharmacological aspects of mental disorder has been initiated. An effort is being made to coordinate community facilities in the field of mental disorders. During the past year advances have been made in the over-all integration of the Texas Medical Center, of which the Baylor University College of Medicine is a part.

The University of Vermont College of Medicine reports increased financing of its program through state sources. The curriculum of the second and fourth years has been drastically modified to allow correlation in the second year of all courses with the course in pathology and to allow extensive work in the outpatient department during the fourth year.

Queen's University Faculty of Medicine has separated its department of eye, ear, nose, and throat into departments of ophthalmology and otorhinolaryngology.

The University of Saskatchewan College of Medicine will initiate its first third year of instruction in the fall of 1955. The departments of medicine, surgery, pediatrics, psychiatry, social medicine, and rehabilitation will continue efforts to present integrated instruction in lectures and correlation clinics. McGill University Faculty of Medicine reports the appointment of a committee to reevaluate its over-all curriculum and objectives and to recommend such modification as deemed desirable.

CONSTRUCTION OF FACILITIES

The annual reports from the medical schools to the Council indicate that during 1954-1955, 35 institutions in the United States and 2 in Canada have either completed or initiated construction and equipment of new facilities. Table 5 summarizes this information. Completed construction in medical schools in the United States totaled $99,384,986 of which $46,981,000 was for basic medical sciences teaching and research, $47,957,000 for hospital and clinic developments, and $4,446,986 for dormitory facilities. Construction initiated totaled $80,971,288, of which $60,330,029 is for basic medical sciences teaching and research, $19,395,000 for hospital and clinic programs, and $1,246,259 for dormitory facilities. Two Canadian schools report the initiation of construction estimated to cost $2,100,000 for basic medical sciences, and one reports $1,500,000 for initiated clinical laboratory facilities.

The significance of these figures is definitely limited. They indicate that considerable sums are being expended to improve and augment facilities for medical education. They do not, however, give a clear or comprehensive picture of developments of hospital and clinic facilities that are utilized as part of medical education programs but financed by governmental or private funds and not by the school. Such developments as the new Metropolitan, Jacobi, and Van Etten hospitals in New York City, which will become the major basic clinical teaching units of the New York Medical College and Albert Einstein Medical School in return for the professional care responsibilities assumed by the medical schools, represent tremendous investments of significance to medical education although their chargeable value to it would be impossible to determine with any reasonable certainty. Grady Hospital in Atlanta, in which some of the clinical teaching of Emory University Medical School is conducted, is another example among many where professional responsibilities for patient care are assumed by the school in return for the educational advantages afforded by the hospital. The many examples of arrange-

ments of this and similar types make it almost impossible to give an accurate picture of the investments in facilities and equipment that in some way have impact on opportunities in medical education.

REGIONAL PROGRAMS AND MEDICAL EDUCATION

Because of the relatively high cost of medical education, it is important that existing facilities in this field be used to their maximum potentialities and that their support be reasonably distributed. In the past some of the states unable to finance the development of higher education in its various branches lacked opportunities for some of their students. State-supported institutions have tended to restrict admission to outside students partially because of the fact that tuition represented such a small factor toward coverage of actual educational costs. During recent years the development of cooperation among groups of states through the mechanism of regional compacts in higher education has indicated one of the ways financing can be improved and costs more reasonably equalized per student among compact states. Both private and public institutions have been utilized in the interstate compacts to date, and it is important that both continue to participate in any future developments of this nature.

Because of the potential significance of broader opportunities in professional education and its improved financing through the medium of interstate cooperation, it is felt desirable to present a résumé of developments along these lines in the current report on medical education. The important implications of cooperative programs of this type transcend the field of undergraduate medical education and may in the future have increasing significance in continuing education through regional postgraduate medical education programs.

Several years ago 14 southern states approved a compact under which they obligated themselves to work with each other, with colleges and universities, and with agencies concerned with higher education to the end that through joint effort they might more rapidly advance knowledge and improve the social and economic level of their region. In the fall of 1948, a full-time staff was set up to survey the most urgent needs of the region in the field of professional and graduate education. Commissions were appointed on medical and related training (including medicine, dentistry, nursing, and pharmacy), veterinary medical training, and graduate studies, and careful evaluations were made by them.

The first regional activity which was undertaken by the Southern Regional Education Board (1949) was based on the exchange of funds between states desiring training for students in certain professional fields in which those states themselves did not provide student facilities and institutions which could provide them. To make this possible, contracts were established between the board and the states on one hand, and between the board and the institutions on the other. During 1951-1952 contracts in medicine, dentistry, veterinary medicine, and social work provided places for approximately 850 students. In 1952-1953, the program provided places for 1,059, and since that time it has continued to grow and to serve an effective role.

During 1954-1955, a total of 1,004 "regional students" were enrolled in 18 institutions under the Southern Regional Education Board. Their home states paid an aggregate of $1,314,715 to the institutions they attended. The third group of "regional students" have received their professional degrees in medicine (84), dentistry (69), veterinary medicine (96), and social work (16). With the graduation of this group, nearly 700 southern students have completed such professional training as a result of the Southern Regional Education Board contract arrangements.

The Southern Regional Education Compact and its bylaws indicate two general means by which the Regional Education Program may be developed. One of these is the joining of existing institutions and agencies in planning and executing regional programs in education; to date, this is the method that has been utilized. Secondly, provision is made for the establishment of new institutions to meet the region's needs, but only if existing institutions do not have adequate facilities and do not wish to create them.

In 1949, governors of 11 western states and 2 territories unanimously endorsed the principle of close interstate cooperation in higher education. The Western Governors' Conference concluded that not all states individually had sufficient numbers of potential students to warrant the establishment and maintenance af adequate facilities in all the essential fields of technical, professional, and graduate training; nor did all the states have the financial ability to furnish within their borders institutions capable of providing acceptable standards of training in all these fields. They did, however, express the conviction that some of the western states or groups of them could provide acceptable and efficient educational facilities to meet the needs of the region and its students. It is of interest to comment that, prior to the endorsement of the regional principle by the Western Governors' Conference, the University of Colorado School of Medicine had established a program whereby students from a neighboring state were accepted under provisions that the sender state transfer funds to cover basic educational cost above tuition. Even earlier the Medical College of Virginia and Meharry Medical College had developed programs involving interstate cooperation and financing.

By March of 1955, nine of the western states had ratified the Western Interstate Compact for Higher Education. An idea of the manner in which the program works can be presented by the example of the state of Washington, which was the ninth state whose legislature ratified the compact last March. Along with enabling legislation the state legislature passed an appropriation to share the costs of operating the Interstate Commission for Higher Education. About one-third of the students in Washington's professional school of veterinary medicine at the state college and from 10 to 15% of those in medicine and dentistry at the university have been coming from other states that are now members of this compact. Washington's membership now provides an opportunity for other compact states to send students to Washington's professional schools under the contract program. For each of these students in the program,

Washington will be able to collect not only regular in-state tuition but also special fees (paid by the sending state) of $2,000 for medicine, $1,600 for dentistry and $1,200 for veterinary medicine. The legislation which was approved "cedes none of the rights of the institutions nor of the state." It is permissive only and permits arrangements by which states sending students tangibly help meet educational costs of their education in an institution supported by another compact state.

During recent years various groups in New England have discussed proposals for the establishment of some form of cooperative machinery for higher education. In May of 1953 the legislatures of Maine, New Hampshire, and Vermont authorized their state universities to act as agents for entering into contracts with institutions in or out of the state, private or public, to supply medical and dental education or any education not offered at the home state university. This enabling legislation was the first step toward greater regional cooperation in the New England area. There currently is considerable interest in a five or six state regional arrangement in New England. Whether in medicine this will be restricted to improve support for existing schools or ultimately bring about the establishment of a new school under the sponsorship of several states has not yet been determined.

TABLE 6.—*Estimated Sources of Basic Medical School Operating Budgets, 1955-1956*

No. of Schools	Source of Funds	Amount	Percentage of Total
48	Government (state, municipal, federal) appropriations	$47,727,835	48.7
47	Endowment income	10,358,181	10.6
81	Tuition income	19,210,304	19.2
34	General university funds	6,286,416	6.3
78	Gifts, grants, and other sources	14,429,885	15.2
	Total	$98,012,621	100.0

MEDICAL SCHOOL FINANCING AND ESTIMATED 1955-1956 BUDGETS

In keeping with the annual reports of the past several years, the Council on Medical Education and Hospitals has endeavored to present statistical information in regard to the financial support of undergraduate medical education and certain allied activities. The questionnaire on Medical School Statistics for 1954-1955 included an inquiry on projected budgetary information for 1955-1956. The following information was requested: (1) anticipated income and its source for general operating expenses of the medical school exclusive of income for hospitals, grants for research, and special projects, (2) anticipated income from outside agencies for research projects and teaching grants, (3) anticipated income available for hospitals or dispensaries owned by the medical school, and (4) a provisional breakdown of approximate allocations of the budget to administration, maintenance of buildings and grounds, equipment and supplies, salaries, research supported directly by the school, and other expenses.

As has been previously reported, there are many variables involved in medical school financing, and it is difficult to ascertain that all institutions have presented data so that it can be uniformly interpreted. The complex nature of teaching programs tied in with medical service activities, certain aspects of research, and educational services rendered to other schools or hospitals within the fabric of a university organization all make it exceedingly difficult for some institutions to evaluate all budget factors with certainty. True comparative analysis of medical school budgets is difficult because of the great variations in institutional organization and responsibilities. The accompanying data is restricted, therefore, to a presentation of general information in regard to current medical school financing based on material submitted to the Council in response to the present medical school questionnaire.

For purposes of this report the term "basic budget" is restricted to funds utilized for the operating activities of the school exclusive of appropriations for hospitals and clinic operation and maintenance or grants-in-aid for research or teaching from outside sources. Estimated 1955-1956 basic budgets for the 75 four year schools in the United States total $95,458,428 and for the 6 two year schools of basic medical science, $2,554,193. Thus, the total anticipated 1955-1956 basic budget for the 81 approved medical schools in the United States is $98,012,621. Forty-two of the four year and five of the two year schools receive governmental appropriations from state or municipal sources, and one four year school obtains federal funds for its basic budget. Such governmental appropriations account for $47,727,835 (48.7%) of the total projected 1955-1956 basic budget for medical education. Forty-six of the four year and one of the two year schools report $10,358,181 (10.6%) of the total basic budget as anticipated from income on endowment. Tuition charges in the 81 medical schools for 1955-1956 will approximate $19,210,304 (19.2%) of the total. Thirty-four schools indicate that $6,286,416 (6.3%) of the total basic budget will be derived from general university funds. The remaining $14,429,885 (15.2%) will be derived from gifts, grants, and other sources.

This analysis is presented in summary form in table 6. It is desirable to emphasize that this summarization constitutes a general picture of the source of total funds in each of the categories in relation to the total projected 1955-1956 basic medical school budget. The percentage allocations, therefore, should not be interpreted as the budget distribution of individual schools. For instance, 33 of the 81 schools receive no basic budget appropriations from governmental sources, 34 have no endowment income, and only 33 report allocations from general university funds. On the other hand, in some state institutions governmental appropriations constitute the major source of all basic budget funds, while in some private schools the largest single source of anticipated income is endowments. It is relatively easy to determine the total estimated income from tuition and the percentage of the anticipated basic budget which it represents for all institutions. However, the importance of the tuition income factor in the budgets of individual schools

varies widely from less than 2% in one of the state-supported schools to over 84% in one of the private institutions.

The projected 1955-1956 basic budget represents an increase of $4,604,309 over the 1954-1955 anticipated budget presented in the last report. Since this 1955-1956 budget includes one new four year school budget and materially augmented budgets in two of the schools currently enlarging their programs from two to four year institutions, the actual over-all increase for the remaining 78 approved schools represents less than 2 million dollars. Thus, in interpreting data from year to year, it is necessary to know whether any increase over a previous year represents the same number of medical schools or whether it includes additional medical school budgets or augmented budgets of two year schools enlarging to four year programs.

There is a marked increase in anticipated estimates of support from research grants from outside agencies. The sum of $54,470,989 projected for 1955-1956 represents an increase of $9,087,115 over the amount anticipated from such sources in 1954-1955. Teaching grants from outside agencies to medical schools during 1955-1956 are estimated at $7,035,905, an increase of only $161,494 over the previous year. Thus, in funds obtained from sources for activities supported in addition to those covered by the basic medical school budgets, the most significant increase is that associated with the support of research activities.

It is of interest to note that 16 medical schools anticipate grants-in-aid for research and teaching from outside sources in excess of $1,000,000 and that 7 of these present estimates in excess of $2,000,000. Further analysis of data available reveals that 15 of the four year medical schools anticipate income from such grants for research and teaching from outside sources in excess of their basic total operating medical school budgets. Table 7 is a recapitulation of estimated funds available to medical schools in the United States for 1955-1956 for basic operating budgets and from grants from outside sources for research and teaching. In comparing this total of $159,519,515 with that of $148,645,201 for the 1954-1955 period, it should again be emphasized that the new total includes an additional four year school and two schools of basic medical sciences in transition to four year programs.

Costs in connection with the activities of basic medical education, like costs in other fields, have continued to increase. While some institutions have enjoyed modest augmentation of funds for basic operational costs, this has not been true of others which continue to encounter very difficult financing. Institutions where 50% or more of the basic operational budget is dependent upon tuition and fees face particularly difficult financial problems. Average tuition rates would seem to be at an almost maximum level consistent with the ability of medical students and their families to meet them and the other costs involved, such as board and room, laundry, transportation, and miscellaneous expenses.

The financing of research in association with medical school activities presents an interesting picture today. Medical schools furnish physical facilities and some equipment, as well as the time and effort of costly faculty personnel for research. However, data obtained from the annual questionnaire indicate that in budgeting, 23 of the medical schools have allocated a total of $1,563,184 to the direct support of research activities from the basic operating budget. This implies that well over 95% of the expenditures for the important research activities that are now being conducted in medical schools are met by the $54,470,989 obtained from grants for research from outside agencies. It should be reemphasized that medical schools basically support research to a larger degree than is represented by the direct allocation of $1,563,184, through the facilities and equipment they furnish, as well as the faculty personnel, time, and effort allocated to such activities. However, the available data clearly highlight the fact that the current research activity is almost totally dependent on outside sources for financial support, and that these sources have become an increasingly essential factor in the development and maintenance of medical research.

Because of its steadily increasing role and significance in the support of medical research and special teaching projects over the past decade, the United States Public Health Service was requested to prepare a summary of the educational values of its grant and award programs during this period. The tabulation and informative summary on the next page which was prepared by officials of the National Institutes of Health, will be of interest to all individuals and organizations concerned with medical education and research. It clearly illustrates that the partnership role of the Public Health Service in the promotion of medical education and medical research has been increasingly substantial in nature and is essential to the maintenance of the current high level of investigative activity as well as certain teaching activities of the medical schools.

TABLE 7.—*Estimated Funds Available to Medical Schools, 1955-1956*

(This does not include funds for construction, which are summarized in table 5, nor does it include operational costs of major clinical facilities.)

Category	Amount
Basic budgeted funds and appropriations (table 6)...	$ 98,012,621
Research grants from outside sources.....	54,470,989
Teaching grants from outside sources.....	7,035,905
Total	$159,519,515

EDUCATIONAL VALUES OF THE GRANT AND AWARD PROGRAMS OF THE UNITED STATES PUBLIC HEALTH SERVICE

Unprecedented scientific achievement during World War II led to general appreciation of the benefits to be derived from intensive programs of medical research and education. Such programs to be of maximum value must seek new basic knowledge and apply it to the understanding of major health problems, notably those arising as infectious diseases decline and the life span lengthens. To help meet this need, Congress has increased its appropriation to the Public Health Service's research bureau, the National Institutes of Health, from $2,835,000 for 1945 to $97,573,000 for 1956. Approximately two-thirds of each year's appropriation is awarded to non-

federal institutions, agencies, and individuals, largely for the support of research projects and the development of scientific manpower.

The National Institutes of Health, located at Bethesda, Md., comprises seven institutes organized to support and conduct research on the major chronic and infectious diseases. The program areas include heart disease, cancer, mental disorders, neurological diseases and blindness, arthritis and metabolic diseases, dental diseases, and microbiological problems. Serving the various institutes is the Division of Research Grants and the Clinical Center, a 500-bed facility for clinical-laboratory research. Over the past decade, the National Institutes of Health has assumed an important place in the nation's medical science structure. The scope of its support is indicated by the tabulation below:

TABLE 7A.—*National Institutes of Health History of Appropriations for Grants and Awards Combined Programs, Fiscal Years 1945-1956*

Yr.	Training Awards	Research Fellowships	Research Grants
1945	$ 29,000	$ 28,000	$ 85,030
1946	25,000	44,600	780,158
1947	250,000	178,000	3,576,198
1948	2,809,700	520,000	9,145,000
1949	3,930,000	1,115,000	10,871,492
1950	6,415,050	1,448,057	13,065,514
1951	6,928,200	1,565,000	16,713,000
1952	7,392,000	1,755,000	18,173,000
1953	8,194,000	2,024,000	20,374,000
1954	10,813,000	2,133,000	28,866,000
1955	11,051,000	2,562,000	33,918,000
1956	14,502,000	2,800,000	38,038,000

Training Grants.—Research manpower bears a crucial relation to the nation's health, for the quality and volume of medical research is directly proportional to the caliber and number of workers devoted to the medical and biological sciences. Closely related to the growing problem of manpower shortage in these fields is the need for physicians with special competence in the treatment of major chronic diseases. National Institutes of Health grants for training and teaching provide direct aid to educational institutions. They help schools equip medical students and professionals in certain related areas with the latest medical knowledge. Although awarded for a one year period, the grants have been uniformly renewed upon request. They are available from the National Cancer Institute, National Heart Institute, National Institute of Mental Health, National Institute of Arthritis and Metabolic Diseases, and National Institute of Neurological Diseases and Blindness.

The first three of these institutes award grants for the support of training at undergraduate levels. The specific purpose is to establish, expand, improve, or continue instruction related to health problems within the institute's program. Applicants that have received grants to date include schools of medicine, dentistry, and public health. The present maximums for grants in this category range from $5,000 for teaching of cancer in dental schools to $25,000 for cancer or heart grants to four year medical colleges.

Graduate training grants are awarded through the National Heart Institute and the national institutes of arthritis and metabolic diseases, neurological diseases and blindness, and mental health. These awards have a twofold purpose, to help the schools improve their instructional programs and to make funds available for trainees' stipends. In the case of the National Institute of Mental Health, grants are made to training institutions for: (1) instructional and other expenses of training, (2) aid to trainees in the payment of expenses, and (3) research with a view to evaluating and developing instructional methods. The subjects covered are psychiatry, clinical psychology, psychiatric social work, psychiatric nursing, and public health. Support may be requested for a maximum of five years.

In the cancer field, where National Institutes of Health training grants were first employed, some typical results have been the acquisition and retention of superior instructors, improved teaching practices including wider use of visual aids, establishment of cytology and isotope laboratories, increased awareness of cancer on the part of both faculty and students, and more thorough utilization of available knowledge. Every medical school in the country is participating. Cancer coordinators, designated by the schools, have been an important factor in organizing and rounding out the teaching programs.

Traineeships.—In addition to the trainee stipends awarded locally out of training grants, the Public Health Service offers direct traineeships through the National Cancer Institute, National Heart Institute, National Institute of Arthritis and Metabolic Diseases, and National Institute of Neurological Diseases and Blindness. These awards are intended to increase the number of physicians and allied workers engaged in specialized clinical activities. They are of two types: regular traineeships to qualified citizens with an appropriate doctoral degree ($3,400 the first year and $3,700 the second year, plus $350 per dependent child and spouse), and special traineeships (in varying amounts) to citizens with unusual competence or in need of specialized training for a specific problem. They are generally made for one year but may be renewed and permit the trainee to study at the institution of his choice.

Research Fellowships.—The research fellowships program of the National Institutes of Health provides financial assistance to promising American scientists during their training period, so that they can pursue careers in medical research and allied fields. These fellowships are awarded on a competitive basis upon the recommendation of scientific committees. A research fellow may conduct his work at any institution where interest, guidance, and facilities are suitable. Nine out of 10 fellowship recipients remain in medical research after their training.

Four classes of research fellowship are available: (1) predoctoral, (2) postdoctoral, (3) special, and (4) the medical and dental student part-time research fellowship grant. Predoctoral research fellowships are awarded to qualified persons with a bachelor's degree intending to prepare for graduate training in a health science. Annual stipends range from $1,400 to $1,800, plus $350 per dependent child and spouse. Postdoctoral research fellowships require an M.D., Ph.D., D.D.S., or equivalent degree. The stipend is $3,400 the first year and $3,700 the second, plus $350 per dependent. Special research fellowships require unusual competence for research or

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specialized training, as well as a doctor's degree in medicine, dentistry, or related fields, and the stipend is determined at the time of award. Fellowships of the fourth-listed class are awarded to acceptable medical or dental schools in units of $400 each. Medical schools may request up to four units and dental schools up to two, plus an additional 8% allowance for indirect costs. The award may cover part-time activities of a selected student during the school year or full-time activities during the summer vacation. (Other fellowship allowances include the $500 supply grant to an institution sponsoring postdoctoral or special fellows, tuition provided as part of a fellowship award, and expenses for certain travel.)

Research Grants.—The most extensive National Institutes of Health program in terms of expenditure, the research grants program, has been not only a forceful stimulus and aid to medical research, but has also contributed significantly to the education of junior participants in the grant projects. Tremendous expansion of the program has been accompanied by increased research support from various sources and by dispersion of research throughout the country's medical schools, universities, and hospitals. This year, support is being given to 372 research institutions in 47 states, the District of Columbia, 2 territories, and 9 foreign countries.

All seven institutes award grants to support research projects within their particular fields, and the Division of Research Grants is responsible for grants not encompassed by any institute's program. During the fiscal year 1955, 3,261 research grants were awarded. (These support 731 projects in heart research, 720 in cancer, 432 in arthritis and metabolic diseases, 400 in neurology, 236 in microbiology, 223 in mental health, 49 in dental, and 470 in subjects outside these areas.) In addition, cancer field investigation grants totaled 86. Because of the acute shortage of research personnel in psychiatry, career investigator grants were recently established by the National Institute of Mental Health. These are special research grants to assist in opening research careers to qualified young psychiatrists and scientists in related disciplines by providing three to five year support for full-time research at the recipient institution.

Primarily, the purpose of the research grants program is to expand research in medical schools, hospitals, and other nonprofit institutions, and to stimulate new investigation in neglected fields. Research grant applications are reviewed by panels composed largely of nonfederal scientific specialists, and the awards are made only upon the recommendation of appropriate national advisory councils. The several councils are composed of nonfederal leaders in science, education, and public affairs. (Further information and application forms may be obtained from the national institute concerned. For research fellowship applications, write to the Division of Research Grants, National Institutes of Health, Bethesda 14. Md.

Visiting Scientist Program.—The purpose and spirit of the visiting scientist program is to increase the utility of the National Institutes of Health as a national research resource and to strengthen interrelations with the broader scientific community. Two levels of appointment have been established: (1) visiting scientist and (2) research associate in the visiting scientist program. Both awards require a doctoral degree or equivalent training and experience. In addition, the visiting scientist must have outstanding ability and at least six years' postgraduate experience in research. The caliber of both recipients must be such that their work at the National Institutes of Health would be mutually beneficial to themselves and the staff.

Conferences and Symposiums.—In addition to the obvious educational components of the grants and training awards, these programs afford educational opportunities through the full or partial support of congresses, seminars, and symposiums related to the field under scrutiny. For example, the Heart Institute aided in the Second World Congress of Cardiology, which assembled the current cardiovascular knowledge of 50 nations. The Institute of Neurological Diseases and Blindness participated in a special conference of the American League Against Epilepsy, which recommended changes in state laws affecting 1,500,000 epileptics. Among the conferences sponsored or cosponsored by the National Cancer Institute have been the National Cancer Conference, the Sixth National Gastrointestinal Cancer Conference, and the Annual Cancer Coordinator's Conference. The National Institute of Mental Health supports meetings to exchange information on particular mental health subjects, to provide orientation and training in specific services, and to review and develop curriculums, functions, and standards for various professions. As part of its continuing educational program, the National Institutes of Health provides personnel and exhibits for medical and scientific meetings of state, regional, and national scope.

Increasingly, National Institutes of Health clinical conferences, lectures, and seminars are attracting the active participation of physicians from private practice, faculty members of universities and medical schools, and staffs of other service hospitals and research centers. As a net result, the National Institutes of Health participates in the educational contribution of institutions of higher learning in the biomedical sciences.

MEDICAL SCHOOL FACULTIES

For the past several years the Council has presented a résumé of data in regard to currently unfilled teaching positions in medical schools in the United States. Table 8 summarizes the information submitted by schools as projected for 1955-1956. In the basic medical sciences fields the medical schools report 32 new and 76 old, or a total of 108, authorized and budgeted positions currently unfilled in their faculties. Clinical departments report 82 new and 61 old, a total of 143 unfilled positions. Distribution according to rank reveals that 53 of the vacancies are professorships, 52 associate professorships, 79 assistant professorships, 60 instructorships and 7 assistants or associate positions. The total number of vacancies reported is seven less than the number recorded for 1954-1955. In view of the newly developing programs and new faculty appointments that have been made during the past year, this slight improvement in unfilled posts is perhaps more significant than it appears on the surface. However, as the new school programs undergo further development, the need for faculty personnel will continue to increase. Recruitment of highly

qualified medical faculty full-time personnel promises to continue as a challenge to medical education.

Because of increasing interest in the problems associated with the financing of clinical faculty personnel, last year's annual report included for the first time an analysis of the status of faculty personnel in clinical departments. In recent years there has been considerable misunderstanding on the part of many individuals as to the implication of the term "geographical full-time" in connection with clinical faculty appointments. As ordinarily utilized it implies that the individual faculty member conducts all of his activities in the "geographical" environment of the medical school. The institution usually pays a basic salary to the faculty member in this category, and he is permitted to have additional income from consultations or from private practice conducted in addition to his teaching, administrative, and research responsibilities. Because of the costliness of financing absolute full-time clinical personnel receiving salaries with no other income from professional activities and the accompanying limitations, relatively few institutions have found it possible to maintain adequate clinical faculty personnel without the utilization of some form of "geographical" arrangements.

TABLE 8.—*Number of New and Old Authorized and Budgeted Full-Time Positions by Departments in the Medical and Basic Sciences Schools of the United States, 1955-1956*

	New	Old	Total
Basic Sciences Departments			
Anatomy	3	15	18
Biochemistry	2	6	8
Microbiology	8	7	15
Pathology	9	24	33
Pharmacology	4	15	19
Physiology	6	9	15
Totals	32	76	108
Clinical Departments			
Anesthesiology	5	5	10
Dermatology	1	..	1
Internal Medicine	15	13	28
Neurology	1	1	2
Neurology and Psychiatry	10	11	21
Obstetrics and Gynecology	9	7	16
Ophthalmology	1	1	2
Otolaryngology	..	2	2
Pediatrics	8	4	12
Physical Medicine	2	2	4
Preventive Medicine	11	3	14
Radiology	6	2	8
Surgery	12	10	22
Urology	1	..	1
Totals	82	61	143
Analysis of Faculty Rank of Vacancies			
Basic Science Departments			
Full professors	3	11	14
Associate professors	7	13	20
Assistant professors	12	22	34
Instructors	10	26	36
Associates	..	1	1
Assistant instructors	..	3	3
Totals	32	76	108
Clinical Departments			
Full professors	18	21	39
Associate professors	20	12	32
Assistant professors	29	16	45
Instructors	12	12	24
Assistants	2	..	2
Associates	1	..	1
Totals	82	61	143
Grand totals	114	137	251

On the basis of information currently available, it would appear that the manner in which clinical faculty personnel are employed must depend upon the peculiar needs of each individual school. Problems of medical school financing reveal that there is no single answer suitable or applicable to all institutions and that arrangements must be made at the local level that serve the best interests of the school and maintain its relations with the local medical profession, from which the average institution must derive much of its clinical instruction. Conscientious study, thorough understanding, and satisfactory communication between medical schools and medical professional organizations in any given locale should make it possible to develop plans for the employment of clinical faculty personnel as nearly mutually satisfactory to all concerned as possible.

It is important, however, to note in passing that problems centered around this area of medical school functions have in some instances led to serious misunderstanding and difficulties between professional and school groups. It has resulted in the introduction of a resolution to the House of Delegates of the American Medical Association in 1954 on the part of one state medical association directed against "the practice of medicine" by personnel of tax-supported medical schools and requesting the establishment of a definite over-all policy covering employment of medical faculty members in such institutions.

Subsequently the Council on Medical Service of the American Medical Association was asked to conduct an inquiry into the practices of medical schools in the employment of clinical faculty personnel. In conference with representatives of the Council on Medical Education and Hospitals, the Association of American Medical Colleges, and the American Hospital Association, a questionnaire was designed to obtain comprehensive information from the medical schools. The Council on Medical Service has also designed a questionnaire for the medical societies in locations where medical schools exist. The results of these questionnaires are being analyzed, and a report of the findings will be made in the near future. It is to be hoped that this information will be of great value in clarifying some of the areas of misunderstanding and allaying some of the misapprehensions that have appeared with increasing frequency in recent years.

It is not easy to develop and retain high caliber medical faculty personnel in either basic medical science or clinical areas. It is important that members of the medical profession in the locale of a medical school fully understand and appreciate the problems of the school and that the school in turn have full knowledge and appreciation of the problems of the profession. Only through mutual confidence in the integrity of each, through established and satisfactory mechanisms for review of misunderstandings and difficulties, and through concerted effort to adjust them satisfactorily can these problems be minimized or eliminated.

CURRICULUM STUDIES

Legal Medicine, Medical Ethics, Economic Aspects of Medicine, Medical Public Relations, and Medical History.—In each annual report on medical education in the United States and Canada, it is planned to present information on certain facets of the medical school curriculum content. The questionnaire this year included an inquiry on the number of hours specifically allocated to,

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and departments responsible for, instruction in legal medicine, medical ethics, economic aspects of medicine, medical public relations, and medical history. If no specific allocations of time for instruction in any of these areas were included in the curriculum, a request was made as to what method was utilized to develop background knowledge of their importance in medicine today.

Information from the medical schools indicates that 70 of the 81 institutions in the United States allocate definite time to the teaching of legal medicine. This varies from a minimum of one hour to a maximum of 42 hours. Forty-five of the schools allocate over 10 hours and six of this group assign over 20 hours in this field. The average allocation is 12.5 hours for the 70 schools offering specifically assigned teaching time. With the exception of 3 two year schools of basic medical science and 1 four year institution, the remaining group of 11 medical schools indicate that instruction in this field is incorporated in one way or another with other phases of medical education. There is no uniform pattern of handling instruction in legal medicine. Institutions report that this subject matter is taught by departments of legal and/or forensic medicine, preventive medicine, public health, medicine, pathology, pharmacology, neurology, the medical school administration, school of law, a university institute of government, and by special lecturers.

All but six of the four year schools and three of the schools of basic medical science indicate that instruction is given in some form in the field of medical ethics. Only 40 of the 81 schools, however, indicate specific allocations of time, which vary in amount from 2 to 64 hours. Where it is allocated specific time in the curriculum, it is given as medical ethics, cultural medicine, medical law and ethics, public relations, philosophy of medicine, or social and environmental medicine. It is presented by the dean or other administrative officers, by departments of medicine, public health, preventive medicine, cooperatively by several departments, or by medical societies. Those institutions where specific time is not allocated but where some attention is given to student indoctrination indicate that a number of different methods are used. For instance, the faculty of one institution believes medical ethics and medical public relations are aspects of medical knowledge best gained through observation and discussions with small groups of students in class, on the wards, and in clinics. Another indicates that medical ethics, economics, and public relations are integrated with clinical teaching and are conveyed principally by precept. A third accomplishes its purpose through specifically assigned correlation conferences and through creating awareness of the need by day to day teaching within other established courses. In some schools awareness of the importance of the field of ethics is introduced early in the first year through orientation lectures and conferences. In at least three medical schools the local or state medical societies are cooperating in the conduct of lectures and discussions in the fields of medical ethics and medical public relations.

There are nine four-year schools and four schools of basic medical science which report no time allocation for, or specific instruction in, the economic aspects of medicine. All the other institutions indicate that this field receives coverage in connection with such courses as public health, preventive medicine, medical ethics, social and environmental medicine, and legal and economic medicine, through lectures, conferences, and discussions by the dean, or by cooperation with local or state medical societies. Specific allocation of time in 33 schools indicates that consideration of the economic aspects of medicine is assigned from a minimum of one to a maximum of 24 hours.

Twenty-one of the 81 approved medical schools in the United States specifically allocate from one to 11 hours to consideration of medical public relations. Twenty-three of the schools allocate no specific time, nor do they indicate the incorporation of instruction in this field in connection with other courses. All the remaining institutions indicate that some emphasis is given to medical public relations in connection with instruction in one or more departments.

Most reports emphasize the importance of constant presentation of ethics, economics, and public relations as an integral part of all phases of undergraduate medical education in the precept and example of teachers and members of the profession with whom students have contact.

Seventy-one of the medical schools offer either required or elective work in the field of medical history. Time allocations vary from 2 to 50 hours. These courses are conducted by departments of medical history, cultural medicine, medicine, surgery, anatomy, public health, pathology, physiology, preventive medicine, and social and environmental medicine and in orientation courses. In a number of institutions, medical history is an interdepartmental offering, and in two schools the course is conducted by the American College of Physicians. In a few schools efforts are made to highlight important historical events in connection with individual departmental teaching. Ten of the schools report no time allocation for either required or elective work in medical history or any indication of its conscious integration into other courses.

NATIONAL FUND FOR MEDICAL EDUCATION AND AMERICAN MEDICAL EDUCATION FOUNDATION

The 1954 annual report of the National Fund for Medical Education indicates that business, industry, and other segments of society, together with physicians who gave funds through the American Medical Education Foundation, contributed a total of $2,693,170. Grants totaling $2,176,905 were made in July, 1954, to the 80 medical schools approved at the time, which brought the total distribution to approximately $7,000,000 since the initial grants were made in 1951.

During 1954, Public Law 685 granting a federal charter to the National Fund for Medical Education was enacted by Congress. This was recognition by Congress that medical education is of vital national concern and that the fund's role in mobilizing voluntary support for the strengthening of our medical schools is deserving of broad national backing.

The 1954 Annual Report of the American Medical Education Foundation indicates that $3,563,881 of the total funds disbursed to medical schools from 1951 to 1954 were obtained from this source. During the period

1951-1954, the American Medical Association contributed $500,000 annually for a total of $2,000,000. Physicians voluntarily contributed an additional $1,357,638, medical societies and associations $553,662, and others $7,682. At the time the American Medical Education Foundation was instituted, it was understood that, as individual physician contributions increased in number, the American Medical Association would reduce its annual direct contribution. The Board of Trustees of the American Medical Association has reduced its direct contribution to $100,000 this year, while continuing to underwrite the costs of the American Medical Education Foundation program. It is to be hoped that both the American Medical Education Foundation and the National Fund for Medical Education will rapidly gain both in number of contributors and in total contributions.

PRECEPTORSHIPS

Data about preceptorships were supplied for 1954-1955 by the schools as to: (1) whether or not they were included in the curriculum, (2) year established, (3) whether or not preceptors were general practitioners, specialists, or both, (4) whether they were required or elective, (5) their duration, and (6) the number of students participating. In addition, institutions indicated the preceptorship's objectives and means utilized to determine whether the stated objectives were being fulfilled.

TABLE 9.—*Preceptorship Programs, 1954-1955*

Institutions	Yr. Established
University of Arkansas	1952
College of Medical Evangelists	1952
University of California	1952
Stritch School of Medicine	1951
Indiana University	1953
State University of Iowa	1953
University of Kansas	1950
University of Louisville	1952
Boston University	1948
University of Nebraska	1951
Albany Medical College	1952
University of Buffalo	1950
Duke University	1938
Western Reserve University	1952
University of Oklahoma	1949
University of Oregon	1952
Hahnemann Medical College	1953
Temple University	1954
University of Pennsylvania	1950
University of South Dakota	1947
University of Texas	1952
University of Vermont	1929
University of Washington	1949
University of Wisconsin	1926

In 1954-1955, a total of 24 schools offered preceptorships, compared to 22 in 1953-1954. Emory University discontinued its program, Stritch reinstated its preceptorship, Temple established its program, and Western Reserve continued a program established in 1952 that had not been previously reported. Table 9 lists the institutions offering preceptorships in 1954-1955 and the years in which the programs were established. In 15 of the programs, preceptors are general practitioners, and in 6 they are reported to be specialists, while both participate in the remainder of the programs. Preceptorships are offered in the fourth year in 18 schools, in the third year in 3, in the third or fourth year in 1, in the second year in 1, and in all four years in 1 institution. They are required in 10 and elective in 14 schools. Length of preceptorships varies from two weeks to four and one-half months. In 1954-1955, 1,433 students participated in preceptorship programs.

The statements submitted in regard to the objectives sought in the preceptorship program, although varied in their mode of presentation, indicated, in general, a desire to offer students an opportunity to observe closely medical practice as it is actually carried out. The program is believed to afford the students an opportunity to investigate certain types of practice in which they may desire a career, as well as to provide an opportunity to appreciate the scientific, social, economic, and environmental factors in the practice of medicine. One institution expressed its desire to teach the student a "medical way of life," and another tersely indicated its objectives to be identical with those of its over-all undergraduate programs of offering the best possible basic educational experience for its students.

The various methods utilized to evaluate preceptorships include reports from preceptors and preceptees and routine evaluations by deans or committees. Other institutions have utilized polls of students, preceptors, and former students who have taken preceptorships. One institution utilizes questionnaires and conferences with students, an annual conference with preceptors, and adequate liaison between the school administration and preceptors through visits to the preceptors.

The impression is received that preceptorships have been considered as valuable experiences when the programs were well planned and preceptors were carefully selected and thoroughly cognizant of the objectives of the program, as well as interested in it. One institution indicated that students did not seem to be interested in or satisfied with the program and that doctors did not understand the functions of a preceptorship. As was indicated in connection with the editorial discussions of family care programs last year, preceptorship opportunities can be only as good as the planning, personnel, and supervision, and such programs deserve the over-all study and implementation which will make it possible to realize their maximum potentialities as part of an undergraduate medical educational experience.

TEACHING RESPONSIBILITIES FOR OTHER THAN UNDERGRADUATE MEDICAL STUDENTS

1954-1955

In addition to their responsibilities in undergraduate medical education, all the medical schools in the United States and all but one in Canada instruct students in other classifications. The number of individuals other than undergraduate medical students who receive all or part of their instruction from medical faculties continued in 1954-1955 to be twice as great as the total number of undergraduate medical students. For 1954-1955 the medical schools in the United States reported 57,273 students other than undergraduate medical students, and Canadian schools reported 6,211 such students. This represented a decline of 2,107 in the United States schools and an increase of 930 in the Canadian schools. Table 10 analyzes the number and distribution of students other than undergraduate medical registrants for whom medical schools have teaching responsibilities.

TABLE 10.—*Teaching Responsibilities for Other Than Undergraduate Medical Students, 1954-1955*

UNITED STATES School	Dental Students	Pharmacy Students	Nursing Students	Student Technicians	Arts and Science Students	Interns	Residents	Physicians with Fellowship Appointments	Physicians Seeking Advanced Degrees		Other Graduate Students in Basic Medical Sciences		Physicians in Continuation Courses	Totals
									M.S. Degree	Ph.D. Degree	M.S. Degree	Ph.D Degree		
Medical College of Alabama	100	0	149	49	0	16	76	15	0	0	13	8	19	445
University of Arkansas	0	0	0	24	0	18	37	0	0	0	9	1	0	89
College of Medical Evangelists	91	0	165	35	0	23	40	6	3	0	7	0	160	530
Stanford University	0	0	131	10	0	0	0	0	0	2	10	20	210	383
University of California, San Francisco	283	206	150	54	0	58	166	4	0	0	16	19	533	1,543
University of California, Los Angeles	0	0	230	0	0	0	15	1	0	0	1	3	883	1,133
University of Southern California	0	0	0	0	0	0	0	0	0	0	23	40	773	836
University of Colorado	0	0	158	40	0	48	215	0	0	0	0	0	1,421	1,882
Yale University	0	0	130	0	0	46	75	77	0	0	51	29	345	753
George Washington University	0	30	0	6	158	22	40	16	0	0	61	57	214	604
Georgetown University	188	0	183	0	0	11	80	13	19	3	1	10	0	508
Howard University	111	64	42	20	30	3	42	4	0	0	0	0	0	316
Emory University	207	0	85	0	8	62	139	26	0	0	1	8	119	655
Medical College of Georgia	0	0	112	2	4	15	49	0	0	0	1	0	0	183
Chicago Medical School	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Northwestern University	0	0	377	38	10	0	0	0	13	12	26	13	77	566
Stritch School of Medicine	0	0	0	0	0	0	19	0	1	1	23	20	0	64
University of Chicago	2	0	165	0	0	36	119	36	0	9	27	78	0	472
University of Illinois	199	153	18	0	22	22	114	14	9	1	57	9	47	665
Indiana University	125	0	531	15	602	28	130	5	0	0	4	5	471	2,015
State University of Iowa	55	50	179	22	575	20	140	10	0	4	10	5	313	1,383
University of Kansas	0	27	160	115	347	20	105	4	2	0	9	7	2,034	2,830
University of Louisville	230	0	172	12	6	29	83	5	0	0	30	0	0	567
Louisiana State University	0	0	32	0	0	0	0	0	0	0	3	6	0	41
Tulane University	0	0	130	0	20	86	93	19	2	0	9	17	206	602
Johns Hopkins University	0	0	0	0	0	0	0	29	0	0	0	6	66	92
University of Maryland	0	43	28	9	0	22	53	19	0	0	5	7	71	257
Boston University	0	0	65	13	24	0	7	0	0	0	21	13	0	143
Harvard Medical School	28	0	0	0	0	0	0	0	0	0	1	60	489	578
Tufts College Medical School	277	0	0	0	0	0	0	0	0	0	9	7	72	365
University of Michigan	233	92	476	64	255	51	190	0	0	0	0	0	636	1,996
Wayne University	0	0	0	15	0	0	65	0	65	11	35	11	205	407
University of Minnesota	260	81	215	0	1,121	0	0	0	502	113	43	109	1,297	3,741
University of Mississippi	0	45	23	0	0	0	0	0	1	0	2	0	0	71
St. Louis University	157	0	189	69	0	14	38	0	5	0	9	19	0	500
University of Missouri	0	0	30	0	803	0	0	0	0	0	9	5	0	847
Washington University	0	0	0	94	0	57	131	67	0	0	27	1	6	383
Creighton University	91	0	122	0	5	0	0	0	17	0	6	0	118	359
University of Nebraska	0	0	111	23	0	11	35	2	0	0	18	2	0	202
Dartmouth Medical School	0	0	129	20	0	14	53	3	0	0	0	0	0	219
Albany Medical College	0	0	125	0	0	41	50	0	0	0	8	1	642	867
University of Buffalo	125	65	38	0	0	0	0	2	0	1	2	0	339	572
Columbia University	225	0	457	0	0	0	0	0	0	0	0	0	550	1,232
Cornell University	0	0	74	0	0	33	151	11	0	0	1	1	152	423
New York Medical College	0	0	193	0	0	0	20	0	5	0	0	0	62	280
New York University	0	0	542	0	146	0	0	46	0	0	9	18	0	761
State University of New York, New York City	0	0	0	0	0	61	198	10	0	0	0	0	0	269
State University of New York, Syracuse	0	0	213	0	0	26	80	6	0	0	0	15	165	505
University of Rochester	0	0	263	22	120	54	94	25	6	2	51	62	0	699
Duke University	0	0	229	12	0	59	155	22	0	0	16	10	16	519
University of North Carolina	211	142	140	10	20	26	55	11	0	0	59*	12	470	1,156
Bowman Gray School of Medicine	0	0	165	23	0	9	65	2	0	0	1	0	0	265
University of North Dakota	0	0	186	27	63	0	0	0	0	0	3	2	0	281
Ohio State University	588	16	429	35	1,001	0	0	0	0	0	53	28	0	2,141
University of Cincinnati	0	0	0	0	0	52	148	40	0	13	0	4	902	1,159
Western Reserve University	117	0	165	17	0	0	0	0	0	0	19	19	117	454
University of Oklahoma	0	0	120	36	0	17	65	2	3	0	15	21	0	279
University of Oregon	0	0	386	23	0	19	64	1	1	0	11	0	550	1,055
Hahnemann Medical College	0	0	110	26	0	0	0	0	0	0	11	2	73	222
Jefferson Medical College	0	0	0	0	0	25	80	10	0	0	4	15	1,355	1,489
Temple University	0	0	168	22	0	18	0	0	83	4	0	7	34	336
University of Pennsylvania	136	0	0	0	0	32	190	0	0	0	11	55	0	424
University of Pittsburgh	0	0	750	0	0	9	178	0	0	0	7	12	201	1,157
Woman's Medical College of Pennsylvania	0	0	60	0	0	5	16	6	0	0	0	0	0	87
Medical College of South Carolina	0	73	147	7	0	6	46	0	0	0	7	5	84	375
University of South Dakota	0	0	10	5	140	0	0	0	0	0	7	0	2	164
Meharry Medical College	122	0	42	38	0	13	23	1	0	0	2	0	0	241
University of Tennessee	284	195	215	43	0	0	0	0	23	0	33	0	116	909
Vanderbilt University	0	0	0	0	0	31	70	2	0	0	2	11	0	116
Baylor University	0	0	0	0	0	41	127	6	3	0	13	9	0	199
Southwestern Medical College	0	0	73	0	5	97	196	0	0	1	6	1	1,139	1,518
University of Texas	0	0	250	43	6	20	127	6	0	0	11	12	0	475
University of Utah	0	33	27	7	253	29	72	23	1	4	11	17	0	477
University of Vermont	0	0	32	30	4	21	26	32	0	0	0	0	170	315
Medical College of Virginia	207	227	246	64	61	45	105	1	1	0	3	7	0	967
University of Virginia	0	0	202	6	0	24	79	22	0	0	0	2	177	572
University of Washington	286	35	156	38	2,000	60	100	18	0	1	10	41	535	3,280
West Virginia University	0	37	0	25	12	0	0	0	0	0	5	0	0	79
Marquette University	331	0	0	83	0	30	110	0	6	0	37	0	58	655
University of Wisconsin	0	52	224	327	191	17	70	1	0	0	4	5	129	1,020
University of Puerto Rico	0	0	17	15	2	0	0	1	1	0	21	0	0	57
Totals	5,269	1,726	11,218	1,733	8,104	1,652	5,118	673	772	182	1,024	983	18,819	57,273
CANADA School														
University of Alberta	0	0	0	0	0	0	0	0	2	0	3	1	183	189
University of British Columbia	0	0	0	0	0	64	81	7	0	0	0	1	0	153
University of Manitoba	0	0	300	10	0	100	6	12	2	0	0	1	0	431
Dalhousie University	35	26	33	16	37	0	11	0	0	0	8	0	1,811	1,977
Queen's University	0	0	179	5	105	0	0	0	5	1	2	6	0	303
University of Ottawa	0	0	17	0	0	46	0	3	0	0	0	2	2	99
University of Toronto	362	48	29	0	644	153	31	84	1	7	12	32	250	1,653
University of Western Ontario	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Laval University	0	0	0	66	0	135	0	0	2	0	0	5	23	231
McGill University	74	0	0	0	0	0	0	0	0	0	0	0	0	74
University of Montreal	93	156	0	55	68	99	0	0	4	2	2	6	20	505
University of Saskatchewan	0	91	349	19	118	0	8	2	1	0	5	3	0	596
Totals	564	321	907	171	972	597	137	108	17	10	38	57	2,312	6,211

* Some of these may also be candidates for Ph.D. degrees.

The greatest increases in 1954-1955 in the United States schools were in connection with continuation courses for physicians in which 3,504 more were enrolled than in the previous year and an increase of 575 dental students over those registered 1953-1954. There were decreases in arts and science students (2,580), nursing students (465) and student technicians (231). Graduate students working towards advanced degrees in basic medical sciences and clinical areas constitute an important and challenging aspect of medical school responsibility. This phase of medical school activity is discussed more fully in the section of this report dealing with graduate medical education.

As was suggested in the last Education Number of THE JOURNAL, the teaching responsibilities of medical schools for other than undergraduate medical students carry significant budget and personnel implications that necessitate full interpretation by responsible administrators. Interpretation of the true cost of medical education necessitates the evaluation of these other teaching activities and their deduction from over-all budgets where they are included in medical school accounting. The assumption of any teaching responsibility implies the need for adequate personnel, so that the teaching and research activities of a department are not diluted to the point where undergraduate medical students, other students, or both may have less effective opportunities than might otherwise be the case.

Too frequently when a medical school renders service functions to large numbers of students in other areas, either no adjustment or a nominal financial adjustment is made, ostensibly to pay for such services. Frequently such reimbursements fall far short of the actual cost of the services rendered and leave the medical school underwriting the difference, with this additional load interpreted by the uninformed as part of the cost of medical education. This problem appears to fall in the area of budget and accounting practices of medical schools and universities. The true cost of educating undergraduate medical students in a complex university setting or wherever others are also taught by the school can be determined only by utilizing effective budget and accounting methods.

The question as to whether teaching responsibilities for other than undergraduate medical students may unduly dilute either teaching or research, or both, is a matter of local institutional policy. If a medical school administration is fully aware of the implication of additional teaching services from the standpoint of budget, personnel, and facilities and such needs are satisfied, there is no logical reason why either teaching or research in medicine should be diluted in any sense. In fact, with adequate budgets, personnel, and facilities, departments of basic medical sciences carrying such responsibilities may possess even greater potential in both teaching and research than would be the case if their activities were restricted solely to undergraduate medical students and to graduate students in their specific fields.

TABLE 11.—*Schools, Students, and Graduates in the Medical and Basic Sciences Schools in the United States, 1931-1955*

(Students in required intern year are not included.)

Year	Schools	First Yr.	Second Yr.	Third Yr.	Fourth Yr.	Total	Graduates
1930-1931	76	6,456	5,588	5,080	4,908	21,982	4,735
1931-1932	76	6,260	5,462	4,932	4,885	22,135	4,946
1932-1933	77	6,426	5,479	5,017	4,918	22,466	4,895
1933-1934	77	6,457	5,571	4,988	4,937	22,760	5,035
1934-1935	77	6,356	5,642	5,142	4,905	22,888	5,101
1935-1936	77	6,605	5,458	5,230	5,020	22,761	5,183
1936-1937	77	5,910	5,209	5,140	5,158	21,491	5,377
1937-1938	77	5,791	5,225	4,986	5,036	21,587	5,194
1938-1939	77	5,764	5,169	4,917	4,971	21,302	5,089
1939-1940	77	5,794	5,177	4,923	4,894	21,271	5,097
1940-1941	77	5,837	5,254	4,969	4,819	21,379	5,275
1941-1942	77	6,218	5,406	5,087	4,942	22,031	5,163
1942-1943	76	6,425	5,858	5,278	5,100	22,631	5,253
1943-1944	77	6,561	6,071	5,640	5,257	23,529	5,134
1944 (2nd session)	77	6,618	6,140	6,084	5,794	24,666	5,169
1944-1945	77	6,523	5,979	5,700	5,826	24,028	5,136
1945-1946	77	6,600	5,750	5,751	5,655	23,756	5,896
1946-1947	77	6,564	5,575	5,707	5,594	23,940	6,389
1947-1948	77	6,487	5,758	5,154	5,340	22,739	5,543
1948-1949	78	6,688	6,194	5,702	5,086	23,670	5,694
1949-1950	79	7,042	6,344	6,079	5,638	25,103	5,553
1950-1951	79	7,177	6,690	6,263	6,056	26,186	6,135
1951-1952	79	7,436	6,864	6,377	6,395	27,076	6,081
1952-1953	79	7,425	7,063	6,725	6,475	27,688	6,668
1953-1954	80	7,449	7,068	6,983	6,747	28,227	6,861
1954-1955	81	7,576	7,104	6,957	6,946	28,583	6,977

Medical Students

ENROLLMENTS

For the sixth consecutive year, the number of students enrolled in approved medical schools in the United States has established a new record. Complete enrollment data for the individual schools are shown in table 1 and comparative data for this and preceding years are given in table 11.

It should be noted that the figure in table 1 depicting total enrollment for this past year includes 142 special or part-time students, whereas in previous years only full-time students were shown. However, even when this type of student is deleted from the current data, there remains an increase of slightly less than 1%. Approximately two-thirds of the increase is accounted for by the addition of information on the University of California School of Medicine at Los Angeles, which this year had all four classes in attendance and gained approval by the Council on Medical Education and Hospitals.

The entering class was the largest ever enrolled in our schools, and only half the increase over last year is accounted for by the addition of the class at the University of California School of Medicine at Los Angeles. The most significant changes in size of the entering class occurred at the Medical College of Georgia with an increase from 79 to 101 and the University of Maryland with a decrease from 104 to 88 first year students.

The University of Miami School of Medicine in 1954-1955 had the first three classes in attendance, and it is anticipated that this school will be eligible for approval during the 1955-1956 academic year, thus promising new enrollment records again for next year.

Five schools had a total enrollment greater than 600 students. The University of Tennessee College of Medicine led in this respect with a total enrollment of 804. The University of Tennessee and the University of Michigan admitted more than 200 students to their entering classes (221 and 205 respectively). There were six additional schools with first year enrollments of 150 or more students.

V 15
1955

The median first year class for the four year schools was composed of 87 students, and the average had 98 students. The median total enrollment was 338 and the average 375 students. The schools of basic medical sciences had an average entering class of 39.

Enrollment data for approved Canadian medical schools are given in table 2. Comparison of this with similar data for last year reveals a very small increase in both total enrollment and numbers of first year medical students. Those students enrolled in the premedical year and required intern year are not included in the total enrollment in table 2.

It is pertinent to note that 82 United States citizens were enrolled in the first medical year in Canadian schools as compared to 4 Canadian citizens enrolled in the first year class of United States medical schools (table 12). More detailed information in regard to this can be found in the next section of this report.

GEOGRAPHICAL SOURCE OF ENTERING STUDENTS

Information as to the state of permanent residence for entering students was derived from the enrollment data submitted by the medical schools. Table 12 presents the residence of students at the time of their enrollment in the approved medical schools in the United States and Canada.

This table indicates that 41% of all first years students in the United States came from six states (New York, Pennsylvania, California, Ohio, Illinois, and Texas). It is interesting to note that the first year enrollment of all of the medical schools in these states represented 42% of the total enrollment, and that 38% of all medical schools are located in the same states.

There were less than 20 first year students in the medical schools in the United States from each of six states (Nevada, Delaware, Wyoming, New Hampshire, New Mexico, and Montana). The 76 students from these states represented only 1% of the total first year class. There are no medical schools in the six states concerned.

In table 13 are listed the states in ascending order according to the number of enrolled first year medical students per 100,000 population. The six states with the largest number of first year students are well scattered through this list, with half having less than the median number of students per 100,000 population (4.4) and half having more. The six states with the smallest number of first year students enrolled in medical schools, on the other hand, in all instances have fewer students than the median, and five of them are included in the eight states with the lowest freshman medical student representation.

Since last year's report, four states (Vermont, Rhode Island, South Dakota, and Utah) have all gained one or more first year students per 100,000 population. This is balanced by four other states (Nevada, Montana, Florida, and Arkansas) whose student per population ratio decreased by a similar amount.

There were 12 state and one city-owned school that limited enrollment to students who were residents of that state in which the schools were located. It is perhaps pertinent that other residents of these same states, equal in number to 34% of the first year enrollment of these 13 schools, were accepted in medical schools outside their own states. Legislative bodies perhaps should consider the effect that adoption by all medical schools of similarly complete restrictive admission policies would have on the numbers of their own residents who would be able to acquire a medical education. Attention is directed to the section on attrition, where the possible relationships between geographical restrictive admission policies, applications to medical schools, and attrition due to poor scholarship are discussed.

The section of table 12 that depicts the state of residence of students in Canadian medical schools is worthy of notice, for it brings out a fact that has been given little attention. There are 80 United States students enrolled in the first medical year of the Canadian schools. Since there are only four Canadian students in the first year class of our own schools, we are the recipient of a favorable balance that represents an educational opportunity equivalent to another medical school.

United States first year medical students in Canada come from 22 different states with New York (21), Massachusetts (11), and California (11) accounting for more than half of such students. All but two of the Canadian schools are involved, and McGill has 58 United States students in the first medical year. This is more than the first year enrollment in seven of our own approved four year schools and is larger than the entering class in any of our schools of basic medical sciences.

ENROLLMENT OF WOMEN STUDENTS

Information by school on the number of men and women students enrolled and graduated can be found in table 14. Jefferson and Dartmouth continued to limit enrollment to men, and Woman's Medical College enrolled only women students.

The number of women students attending medical school was slightly greater than the previous year, but the number of women graduates in the year covered by this report was the smallest since 1947.

Excluding Woman's Medical College, medical schools of three universities (Columbia; State University of New York, New York City; and University of Tennessee) enrolled 40 or more women, and in four schools (Howard, Columbia, University of Wisconsin, and University of Puerto Rico), women accounted for 10% or more of the total enrollment. Women represented 10% or more of the graduating class in six schools (University of Colorado, Howard, Louisiana State University, Southwestern, University of Wisconsin, and University of Puerto Rico).

Table 15 indicates the number and percentage of women enrolled and graduated by year since 1905. Although there is little evidence of significant change in recent years, the increased enrollment for the past two years may suggest that the absolute and relative decrease in women graduates will be of short duration.

MILITARY LIABILITY OF MALE MEDICAL STUDENTS

In the questionnaire sent to all approved medical schools, each school was asked to classify male students according to whether or not they had any military liability under the Universal Military Service and Training Act, as amended. Male students who had no basic liability for military service were defined as those persons

TABLE 12.—*Geographical Source of*

	School	1 Alabama	2 Arizona	3 Arkansas	4 California	5 Colorado	6 Connecticut	7 Delaware	8 Dist. of Columbia	9 Florida	10 Georgia	11 Idaho	12 Illinois	13 Indiana	14 Iowa	15 Kansas	16 Kentucky	17 Louisiana
1	Medical College of Alabama	82	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
2	University of Arkansas	..	..	92	..	..	..	..	..	..	..	..	..	..	..	..	..	..
3	College of Medical Evangelists	..	..	..	78	..	..	1	..	1	..	2	..	..	..	..	2	..
4	University of Southern California School of Medicine	..	1	..	65	..	..	..	1	..	..	..	..	..	..	..	..	..
5	Stanford University School of Medicine	..	1	..	48	..	..	..	..	..	..	..	..	..	..	..	..	..
6	University of California School of Medicine, San Francisco	..	1	..	76	..	..	..	..	..	..	..	..	..	..	..	..	..
7	University of California School of Medicine, Los Angeles	..	1	..	47	..	..	..	..	..	..	..	..	..	..	..	..	..
8	University of Colorado School of Medicine	..	6	..	..	67	..	..	..	..	..	..	..	..	..	..	..	..
9	Yale University School of Medicine	..	..	..	2	..	13	1	1	..	..	..	..	2	1	..	..	..
10	Georgetown University School of Medicine	..	..	..	4	1	6	..	4	1	..	1	1	..	..	..	..	..
11	George Washington University School of Medicine	..	..	..	14	1	2	..	13	..	1	1	3	1	..	..	..	..
12	Howard University College of Medicine	..	..	1	2	1	1	..	7	..	..	..	6	..	..	1	1	2
13	Emory University School of Medicine	5	..	..	1	..	1	..	..	25	35	..	..	..	..	..	..	..
14	Medical College of Georgia	..	..	..	..	..	..	..	..	..	101	..	..	..	..	..	..	..
15	Chicago Medical School	..	..	..	..	..	1	..	..	..	..	10	..	..	..	..	..	..
16	Northwestern University Medical School	..	1	..	14	1	1	..	1	1	..	5	41	4	1	2	..	..
17	Stritch School of Medicine of Loyola University	..	..	..	2	..	..	..	..	..	..	..	49	4	..	..	..	..
18	University of Chicago, The School of Medicine	..	..	..	7	1	2	..	1	..	..	..	14	3	..	1	..	..
19	University of Illinois College of Medicine	..	..	..	..	..	1	..	..	..	..	..	163	..	..	..	..	..
20	Indiana University School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	149	..	..	..	..
21	State University of Iowa College of Medicine	..	..	..	..	..	..	..	..	..	..	..	4	1	112	..	..	..
22	University of Kansas School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	89	..	..
23	University of Louisville School of Medicine	..	..	..	..	..	..	..	..	2	..	..	2	2	..	..	82	..
24	Louisiana State University School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	126
25	Tulane University of Louisiana School of Medicine	9	1	3	1	..	1	..	20	4	..	2	1	..	1	3	35	
26	Johns Hopkins University School of Medicine	2	..	1	5	..	1	..	1	1	1	..	4	1	..	..	..	..
27	University of Maryland School of Medicine	..	2	..	1	..	1	..	3	1	..	..	1	..	..	1	..	..
28	Boston University School of Medicine	..	..	..	..	..	4	..	..	..	1	..	..	..	..	1	1	..
29	Harvard Medical School	3	..	..	8	1	4	..	2	1	2	1	3	1	..	..	..	..
30	Tufts College Medical School	..	..	..	..	..	10	..	..	..	..	..	..	..	..	..	..	..
31	University of Michigan Medical School	..	..	..	3	1	2	..	..	..	..	..	1	3	..	..	..	..
32	Wayne University College of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
33	University of Minnesota Medical School	..	..	..	1	..	..	..	..	..	..	1	..	..	1	..	..	..
34	University of Mississippi School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
35	University of Missouri School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
36	St. Louis University School of Medicine	1	3	..	13	..	3	..	..	2	..	..	6	2	..	1	3	..
37	Washington University School of Medicine	..	1	1	3	..	..	..	..	2	..	..	4	8	2	1	..	1
38	Creighton University School of Medicine	..	3	..	15	1	2	..	..	..	..	..	2	2	..	10	..	..
39	University of Nebraska College of Medicine	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..
40	Dartmouth Medical School	..	..	..	1	..	3	..	..	..	..	..	..	..	..	..	..	..
41	Albany Medical College	..	..	..	..	..	3	..	..	..	..	..	..	..	..	..	..	..
42	University of Buffalo School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
43	Columbia University College of Physicians and Surgeons	..	2	..	3	1	6	..	..	1	..	2	..	..	..	1	1	
44	Cornell University Medical College	..	..	..	3	..	5	..	..	..	..	1	..	..	..	..	..	..
45	New York Medical College, Flower and Fifth Avenue Hospitals	1	..	..	8	..	12	..	1	..	..	1	1	..	..	..	..	..
46	New York University College of Medicine	..	..	..	1	..	4	..	..	..	..	..	..	..	..	..	..	..
47	State University of New York College of Medicine, New York City	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..
48	State University of New York College of Medicine, Syracuse	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
49	University of Rochester School of Medicine and Dentistry	..	..	..	1	..	1	..	1	..	..	..	4	..	..	..	..	..
50	University of North Carolina School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
51	Duke University School of Medicine	3	..	..	2	1	..	..	..	11	2	..	..	..	..	..	..	1
52	Bowman Gray School of Medicine of Wake Forest College	1	..	..	3	..	..	..	1	3	2	..	4	..	1	..	..	..
53	University of North Dakota School of Medicine	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..
54	University of Cincinnati College of Medicine	..	..	..	1	..	..	..	..	..	..	..	1	1	..	..	6	..
55	Western Reserve University School of Medicine	..	..	..	2	..	..	..	..	1	..	..	1	..	..	1	..	..
56	Ohio State University College of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
57	University of Oklahoma School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
58	University of Oregon Medical School	..	1	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..
59	Hahnemann Medical College and Hospital of Philadelphia	1	..	..	..	..	1	1	..	..	6	..	..	..	..	..	1	..
60	Jefferson Medical College of Philadelphia	..	..	..	1	1	5	3	1	..	..	..	..	1	..	..	..	..
61	Temple University School of Medicine	..	1	..	3	..	1	2	..	..	..	..	..	..	..	..	..	..
62	University of Pennsylvania School of Medicine	2	1	..	2	..	..	..	..	..	..	..	1	1	..	2	1	..
63	Woman's Medical College of Pennsylvania	1	..	..	4	..	2	..	..	..	..	..	..	..	..	..	..	..
64	University of Pittsburgh School of Medicine	..	..	..	..	..	1	..	..	..	..	..	1	..	..	..	..	..
65	Medical College of South Carolina	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
66	University of South Dakota School of Medical Sciences	..	..	..	2	..	..	..	..	..	..	..	..	..	2	..	..	..
67	University of Tennessee College of Medicine	4	2	5	..	..	..	..	..	9	1	..	1	1	..	5	..	..
68	Meharry Medical College	5	..	..	1	..	..	..	1	5	4	..	..	..	..	..	..	2
69	Vanderbilt University School of Medicine	3	..	..	1	..	..	..	..	5	1	..	1	..	1	..	4	2
70	University of Texas Southwestern Medical School	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
71	University of Texas School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
72	Baylor University College of Medicine	1	..	..	3	..	..	..	2	..	..	..	7	..	..	..	..	..
73	University of Utah School of Medicine	..	2	..	2	..	..	..	1	..	..	2	..	..	..	..	..	..
74	University of Vermont College of Medicine	..	..	..	..	..	4	..	..	..	..	..	..	..	..	..	..	..
75	University of Virginia Department of Medicine	..	..	..	..	..	..	..	1	..	..	..	1	1	..	..	..	..
76	Medical College of Virginia	..	..	..	..	..	..	..	..	3	..	..	..	..	..	1	1	..
77	University of Washington School of Medicine	..	..	..	1	..	..	..	..	..	..	1	..	..	..	..	..	..
78	West Virginia University School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
79	University of Wisconsin Medical School	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
80	Marquette University School of Medicine	..	2	..	5	1	..	..	..	..	..	..	11	1	1	..	1	..
81	University of Puerto Rico School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..
	Totals	124	32	103	455	79	105	8	41	96	156	30	357	183	131	102	113	169
82	University of Alberta Faculty of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
83	University of British Columbia School of Medicine	..	..	..	1	..	..	..	..	1	..	..	..	..	..	..	..	..
84	University of Manitoba Faculty of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
85	Dalhousie University Faculty of Medicine	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..
86	Queen's University Faculty of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
87	University of Ottawa Faculty of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
88	University of Western Ontario Faculty of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
89	University of Toronto Faculty of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
90	McGill University Faculty of Medicine	..	..	..	9	..	4	1	..	..	..	..	2	..	..	..	..	..
91	University of Montreal Faculty of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
92	Laval University Faculty of Medicine	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..
93	University of Saskatchewan College of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Totals	..	..	..	11	..	3	1	..	1	..	..	2	..	..	..	..	..
	Grand totals	124	32	103	466	79	110	9	41	97	156	30	359	183	131	102	113	169
	Marginal No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17

* Figures are for students in beginning premedical year.

V 19
195

18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55
Maine	Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	U.S. Territories and Possessions	Canada	Foreign	Home State	Out of State	Totals	Marginal No.
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	82	0	82	1
1	1	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1	1	..	..	..	..	..	..	..	..	1	..	..	..	1	..	2	92	0	92	2
..	..	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	..	..	1	..	..	..	..	1	..	..	78	19	97	3
..	..	..	..	..	..	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	..	65	4	69	4
..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	..	..	..	2	1	..	48	12	60	5
..	..	..	..	..	..	..	..	..	..	..	..	6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	76	1	77	6
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	47	2	49	7
..	2	8	1	1	..	1	..	..	..	1	8	1	23	..	..	2	1	..	3	2	..	..	..	..	..	2	1	..	..	1	..	..	..	1	67	18	85	8
1	3	7	..	..	..	..	..	..	..	1	17	..	39	..	..	..	..	..	13	3	..	..	..	..	..	..	1	1	..	..	..	..	..	..	13	66	79	9
1	6	1	4	1	..	1	1	..	..	..	5	..	12	..	..	1	2	..	7	..	..	..	..	..	7	..	8	1	1	4	..	1	..	2	13	89	102	11
..	2	2	2	..	1	1	..	..	..	..	6	..	6	1	..	2	1	..	7	..	1	..	..	1	..	..	1	..	..	..	..	2	..	15	7	66	73	12
..	..	..	..	..	..	..	..	..	..	..	1	1	..	2	..	..	1	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	1	53	40	75	13
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	101	0	101	14
..	..	..	..	..	..	..	..	..	..	..	3	..	36	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	10	63	73	15
..	..	..	4	2	..	2	2	1	..	..	3	..	9	..	1	8	3	..	2	..	..	1	..	..	6	..	1	4	1	5	..	2	..	1	41	89	130	16
..	..	..	11	3	..	..	..	..	..	..	1	..	5	1	..	6	..	..	4	..	..	..	..	..	..	..	..	1	..	..	..	..	..	2	49	40	89	17
..	1	2	..	..	..	1	..	1	..	..	5	..	20	..	..	4	..	..	4	..	..	..	..	..	..	..	..	..	2	..	..	..	..	2	14	58	72	18
..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	163	3	166	19
..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..	2	..	..	149	5	154	20
..	..	..	..	..	..	9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	112	8	120	21
..	..	1	..	..	1	..	..	..	..	..	2	1	3	..	..	..	..	..	2	..	..	..	..	..	1	..	..	..	..	..	..	..	..	1	89	13	102	22
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	82	18	100	23
..	..	1	..	2	21	4	..	..	..	..	1	..	..	..	..	1	3	1	1	..	..	..	..	..	14	..	..	..	..	..	..	3	..	2	35	102	137	25
1	11	7	..	..	..	..	..	..	..	..	8	..	10	1	..	3	..	..	3	2	2	..	..	..	4	..	..	2	1	3	..	1	..	4	11	69	80	26
..	69	..	..	..	..	..	..	..	..	..	4	..	2	..	..	2	..	..	4	..	2	..	..	..	..	3	..	1	..	1	..	1	..	..	69	78	147	27
3	..	45	..	..	..	..	..	..	..	..	3	..	6	..	..	..	..	..	2	4	..	..	..	..	..	1	..	..	..	..	..	1	..	3	45	30	75	28
3	1	23	2	2	..	1	..	1	..	1	8	..	23	1	..	3	..	..	6	3	..	3	1	..	..	1	1	1	..	2	..	..	2	23	92	115	29
9	..	67	..	..	..	..	..	..	..	..	6	2	7	..	..	..	..	..	..	8	..	..	..	..	..	..	..	..	..	1	..	..	..	..	67	45	112	30
1	..	..	..	..	..	..	..	..	..	..	2	1	3	..	..	6	..	..	1	..	..	..	..	..	..	..	..	..	..	1	4	..	3	..	168	37	205	31
..	..	..	75	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	73	0	73	32
..	..	..	1	112	..	..	1	..	..	..	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..	3	..	1	1	2	112	15	127	33
..	..	..	..	..	56	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	56	0	56	34
..	..	..	..	..	..	45	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	45	0	45	35
..	4	..	2	..	24	1	1	..	..	..	8	..	4	1	2	12	1	1	5	..	..	..	1	1	..	..	..	5	2	..	1	7	..	1	24	161	185	36
..	..	2	..	1	3	26	2	..	..	..	1	..	4	..	..	2	9	..	3	1	..	2	..	3	..	..	..	1	4	..	..	..	2	26	61	87	37
..	1	..	1	4	..	1	..	16	..	..	1	..	7	..	..	1	..	..	1	..	..	..	..	..	..	..	..	3	..	1	..	2	..	..	16	60	76	38
..	..	..	..	..	..	..	..	81	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..	..	2	81	5	86	39
..	..	4	1	..	..	..	..	..	..	3	4	..	3	..	..	..	1	..	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	21	24	40
..	..	2	..	..	..	..	..	..	..	..	4	..	52	..	..	..	..	..	..	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	52	12	64	41
..	..	4	..	..	..	..	..	..	..	..	3	..	70	..	..	..	..	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	70	10	80	42
1	2	6	1	1	..	3	..	..	..	1	13	..	59	1	..	3	..	..	3	..	..	..	1	..	..	2	1	2	..	..	..	..	3	59	61	120	43
..	1	3	..	..	..	..	1	..	..	..	9	..	48	..	..	4	..	1	..	1	1	..	..	2	3	..	..	..	..	..	..	..	1	45	38	83	44
..	1	8	..	..	..	..	..	..	..	..	30	..	74	..	..	..	..	..	5	1	..	..	..	..	1	..	..	..	..	..	..	..	..	..	74	54	128	45
..	..	3	..	..	..	..	..	..	..	..	20	..	190	..	..	..	..	..	3	..	..	..	..	..	..	..	..	..	1	..	..	..	5	100	37	137	46
..	..	..	..	..	..	..	..	..	..	..	10	..	198	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1	138	13	151	47
..	..	..	..	..	..	..	..	..	..	..	3	..	71	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	71	5	76	48
..	..	3	..	..	..	..	..	..	..	..	4	..	41	..	..	6	..	..	5	..	..	..	..	..	..	..	..	1	..	1	2	..	..	..	31	41	72	49
..	..	..	..	..	..	..	..	..	..	..	..	..	2	64	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	66	2	68	50
..	3	1	..	..	..	..	..	..	..	..	1	..	4	34	..	1	..	..	2	..	1	..	2	..	..	..	4	..	2	..	2	..	..	34	43	77	51
..	..	..	..	1	..	..	..	..	..	..	1	..	9	22	..	1	..	..	..	..	1	..	1	..	..	..	1	..	..	1	..	..	1	23	32	54	52
..	..	..	..	1	..	..	1	..	..	..	..	..	2	..	36	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	36	6	42	53
..	..	..	..	..	..	..	..	..	..	..	1	..	2	..	..	73	..	..	..	..	..	..	..	..	..	..	..	1	1	1	..	..	..	..	73	17	90	54
..	..	..	3	..	..	2	..	..	..	..	3	..	6	..	1	59	..	..	8	..	..	..	..	..	..	..	..	2	2	..	..	..	2	..	50	34	84	55
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	150	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	150	0	150	56
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	96	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	96	0	96	57
..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	62	..	..	..	..	..	..	..	..	..	2	..	..	..	1	..	2	62	16	78	58
..	..	..	..	..	..	..	..	..	..	1	19	..	4	..	..	1	..	..	74	1	..	..	..	1	..	..	..	1	..	..	..	1	..	..	74	33	107	59
..	1	..	..	1	1	..	..	..	..	..	21	..	6	..	..	8	..	..	139	1	..	..	..	..	..	..	1	1	3	..	..	..	..	..	176	57	233	60
..	..	..	..	..	..	..	..	..	..	..	10	..	3	..	..	2	..	..	178	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	168	23	191	61
..	3	4	..	1	1	..	..	..	..	..	11	..	5	5	..	4	..	..	80	3	..	..	1	..	..	..	1	..	..	1	..	..	..	..	80	50	130	62
..	..	..	..	1	1	..	..	..	..	..	8	..	10	..	..	2	..	..	14	..	..	..	..	..	..	..	..	..	..	1	..	1	1	4	14	37	51	63
..	1	..	1	..	..	..	..	..	..	..	1	..	..	..	..	2	..	..	92	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	97	8	105	64
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	79	..	..	..	..	..	..	2	..	..	..	..	..	..	79	0	79	65
..	..	..	..	..	..	..	1	..	..	..	1	..	1	..	..	..	..	..	..	..	30	..	..	..	..	..	..	..	..	..	..	..	..	..	30	7	37	66
..	..	..	..	..	14	4	..	..	..	..	1	1	2	5	..	..	2	..	..	..	..	162	..	..	..	..	..	..	..	..	..	..	..	2	162	59	221	67
..	2	..	1	..	8	3	..	..	..	..	2	..	2	6	..	..	..	..	4	..	4	5	2	..	..	..	9	..	1	..	..	..	..	3	67	72	68
..	2	..	1	..	3	1	..	1	..	..	..	..	3	..	..	3	1	1	1	..	2	13	2	..	..	..	1	..	..	..	..	..	..	1	13	40	53	69
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	108	..	..	..	..	..	..	..	..	..	..	..	..	..	..	108	0	108	70
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	172	..	..	..	..	..	..	..	..	..	..	..	..	..	..	172	0	172	71
..	1	1	..	..	1	2	..	1	..	..	1	5	3	..	..	1	3	..	1	..	..	..	..	..	42	..	..	..	..	..	..	2	..	8	42	43	85	72
..	..	..	..	..	..	..	1	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	42	..	..	..	..	..	..	..	1	42	14	56	73
7	..	..	..	4	3	..	..	..	..	..	3	..	6	..	..	..	..	..	..	..	28	..	..	..	..	..	..	..	..	..	..	..	..	..	28	54	82	74
..	2	..	..	..	1	..	..	..	..	..	3	..	3	1	..	1	1	..	1	..	..	2	..	..	..	..	..	50	..	5	..	1	..	2	50	26	76	75
..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	1	..	..	1	..	..	..	..	..	..	..	..	74	..	1	..	..	..	..	74	10	84	76
..	..	..	..	..	..	..	3	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	66	..	..	..	1	1	..	66	10	76	77
..	..	..	..	..	..	..	1	..	..	..	..	..	2	..	..	..	..	..	..	..	..	1	..	..	..	..	..	32	..	..	..	..	..	..	32	0	32	78
..	..	1	3	7	1	..	..	..	..	..	2	..	5	..	1	6	..	..	2	..	..	1	..	..	1	..	..	1	..	78	..	..	..	..	78	4	82	79
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	44	1	2	..	3	44	59	103	80
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	51	..	..	51	1	52	81
28	111	220	282	147	116	133	19	104	1	17	268	19	979	146	42	376	124	67	602	34	93	38	190	354	66	33	161	105	62	154	12	91	4	94	5,210	2,366	7,576	
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	60	0	60	82
..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	53	5	58	83
..	..	..	..	1	..	..	..	..	..	..	..	..	2	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	59	9	68	84
1	..	1	..	..	..	..	..	..	..	..	1	..	2	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	1	48	3	48	85
..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	1	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	61	..	61	86
..	..	2	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	1	58	6	64	87
..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	60	1	61	88
..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	2	1	1	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	129	1	129	89
3	..	6	1	..	..	1	..	1	..	..	2	..	14	..	..	2	1	1	4	..	..	1	..	..	..	..	..	4	1	..	..	..	..	52	7	52	90
1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	116	1	116	91
..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	118	3	121	92
..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	37	2	37	3	40	93
5	..	11	2	1	..	1	..	1	..	1	3	..	21	..	..	3	1	1	4	..	..	1	..	..	1	..	..	4	1	..	..	2	851	25	851	109	960	
33	111	231	284	148	116	134	19	105	1	18	271	19	1,000	146	42	379	125	68	606	34	93	38	191	354	66	34	161	109	63	154	12	93	855	119	6,061	2,475	8,536	
18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	

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who had: (1) between Dec. 7, 1941, and Sept. 7, 1945, served on active military duty in excess of 90 days; or (2) between Sept. 16, 1940, and June 24, 1948, served on active military duty in the armed forces for more than one year; or (3) after June 24, 1948, served on active military duty in the armed forces for two years or more and ended service with an honorable discharge.

Table 16 presents data showing by class the number of male students with and without military liability based on the definitions given above. It is not possible to compare the data with veteran and nonveteran enrollment published in preceding years since different definitions were used.

Male students liable for military service comprised 82% of the first year class, 83% of the second year, 80% of the third year, and 73% of the fourth year.

TABLE 13.—*Ratio of Freshman Students to State Populations, 1954-1955*

Numbers of students per 100,000 population* in the medical and basic sciences schools of the United States

†Nevada	0.5	Maryland	4.4
†Delaware	2.2	Ohio	4.4
†New Mexico	2.5	Massachusetts	4.5
†Florida	2.8	Minnesota	4.7
†Montana	3.0	Virginia	4.7
†Maine	3.1	Connecticut	4.8
Missouri	3.2	†Idaho	4.9
†New Hampshire	3.2	District of Columbia	5.0
West Virginia	3.2	Iowa	5.0
†Arizona	3.3	Kansas	5.2
North Carolina	3.5	†New Jersey	5.2
California	3.7	Mississippi	5.3
Illinois	3.9	Arkansas	5.4
Kentucky	3.9	Colorado	5.6
Alabama	4.0	Oklahoma	5.6
Michigan	4.0	Pennsylvania	5.6
†Wyoming	4.0	Tennessee	5.7
Oregon	4.1	Louisiana	5.8
†Rhode Island	4.3	South Dakota	5.8
South Carolina	4.3	New York	6.4
Texas	4.3	North Dakota	6.6
Washington	4.3	Nebraska	7.7
Wisconsin	4.3	Vermont	8.6
Georgia	4.4	Utah	8.8
Indiana	4.4	United States	4.6

* Estimated July 1, 1954, total population excluding members of the armed forces stationed in each area. Population Estimates, Current Population Reports, Oct. 25, 1954, Series P-25, No. 104, Washington, D. C.
† State with no approved medical school.

It is to be noted that the number cited as liable for service makes no allowance for physical disabilities and other factors that would render an unknown percentage ineligible for service.

PREPROFESSIONAL REQUIREMENTS AND ATTAINMENTS OF THE ENTERING CLASS

Since January, 1953, the minimum requirement for admission to an approved medical school has been three years of college preparatory study. The Council on Medical Education and Hospitals in accepting this minimum recommends for most students a full four year college course in order that a broader background education may be obtained. In its "Essentials of an Acceptable Medical School" the Council also makes provision for the unusually intelligent and mature student, stating that "rarely a school will be justified in admitting a superior student under exceptional conditions after two years of college work."

For purposes of this report, medical schools were asked to stipulate the minimum number of years of col-

TABLE 14.—*Distribution of Students and Graduates in the United States and Canada by Sex, 1954-1955*

	Students		Graduates	
United States	Men	Women	Men	Women
Medical College of Alabama	294	16	77	3
University of Arkansas	303	16	75	4
College of Medical Evangelists	364	22	88	4
University of Southern California	263	12	71	4
Stanford University	223	19	108	8
University of California, San Francisco	294	14	74	4
University of California, Los Angeles	131	9	24	2
University of Colorado	382	26	66	9
Yale University	299	21	75	4
Georgetown University	420	28	105	5
George Washington University	345	17	79	1
Howard University	249	28	67	8
Emory University	281	6	67	2
Medical College of Georgia	319	17	71	5
Chicago Medical School	278	3	62	1
Northwestern University	512	20	132	6
Stritch School of Medicine	232	11	76	3
University of Chicago	264	14	63	4
University of Illinois	620	36	158	12
Indiana University	564	16	129	2
State University of Iowa	446	17	107	0
University of Kansas	435	14	117	4
University of Louisville	361	20	89	2
Louisiana State University	411	31	106	12
Tulane University	501	14	127	2
Johns Hopkins University	266	22	68	5
University of Maryland	370	13	96	4
Boston University	277	19	71	5
Harvard Medical School	487	35	129	10
Tufts College Medical School	430	16	108	2
University of Michigan	573	38	167	6
Wayne University	261	14	65	2
University of Minnesota	455	23	112	4
University of Mississippi	108	6	..	..
St. Louis University	470	9	115	1
University of Missouri	292	1	..	..
Washington University	350	17	92	5
Creighton University	301	9	78	1
University of Nebraska	322	11	77	4
Dartmouth Medical School	47	0	..	..
Albany Medical College	299	6	51	0
University of Buffalo	272	12	66	4
Columbia University	421	45	104	9
Cornell University	329	18	83	2
New York Medical College	459	32	111	5
New York University	503	37	125	10
State University of New York, New York	549	40	131	4
State University of New York, Syracuse	272	12	68	3
University of Rochester	202	12	65	2
Duke University	297	14	74	3
University of North Carolina	234	7	58	1
Bowman Gray School of Medicine	195	9	48	3
University of North Dakota	82	2	..	..
Ohio State University	552	15	134	2
University of Cincinnati	326	9	88	1
Western Reserve University	302	24	81	5
University of Oklahoma	378	10	98	2
University of Oregon	286	13	76	1
Hahnemann Medical College	378	15	99	2
Jefferson Medical College	682	0	169	0
Temple University	473	24	117	8
University of Pennsylvania	475	30	122	8
University of Pittsburgh	364	13	93	3
Woman's Medical College of Pennsylvania	..	381	..	40
Medical College of South Carolina	282	11	64	2
University of South Dakota	62	1	..	..
Meharry Medical College	252	8	62	0
University of Tennessee	764	40	182	6
Vanderbilt University	193	10	46	2
Baylor University	335	18	86	6
Southwestern Medical School	371	29	90	10
University of Texas	586	36	141	7
University of Utah	203	7	51	2
University of Vermont	183	8	46	0
Medical College of Virginia	345	22	95	5
University of Virginia	278	6	62	1
University of Washington	267	19	66	4
West Virginia University	61	3	..	..
Marquette University	379	18	94	6
University of Wisconsin	290	29	68	7
University of Puerto Rico	154	29	36	6
Totals	27,046	1,537	6,632	345
Canada				
University of Alberta	219	11	54	3
University of British Columbia	211	20	50	8
University of Manitoba	240	12	72	4
Dalhousie University	220	9	47	1
Queen's University	225 *	11	49	6
University of Ottawa	194 †	6	47	1
University of Toronto	527 ‡	56	141	14
University of Western Ontario	222	15	56	4
Laval University	440 §	23	132	2
McGill University	409	24	103	9
University of Montreal	395	28	84	7
University of Saskatchewan	63	9	..	..
Totals	3,365	224	835	59
Grand totals	30,411	1,761	7,467	404

* 59 men and 5 women premedical students, 49 men and 6 women fifth year medical students excluded.
† 31 men and 3 women premedical students, 45 men fifth year students excluded.
‡ 242 men and 25 women premedical students excluded.
§ 115 men and 6 women premedical students excluded.

lege work required for admission. One school indicated that the minimum requirement was two years, 72 schools require three years and 8 schools require four years. This information can be found in table 1.

Table 17 presents the composition of the entering class of 1954-1955 of each school according to the number of years of college preparatory work. The number and percentage of entering students holding college degrees are also given.

TABLE 15.—*Women in Medicine in the United States, 1905-1955*

Year	Women Students	Percentage of All Students	Women Graduates	Percentage of All Graduates
1905	1,073	4.1	219	4.0
1910	907	4.0	116	2.6
1915	592	4.0	92	2.6
1920	818	5.8	122	4.0
1925	910	5.0	204	5.1
1926	935	5.0	212	5.4
1927	964	4.9	189	4.7
1928	929	4.5	207	4.9
1929	925	4.4	214	4.8
1930	955	4.4	204	4.5
1931	960	4.5	217	4.6
1932	955	4.3	208	4.2
1933	1,056	4.7	214	4.4
1934	1,020	4.5	211	4.2
1935	1,077	4.7	207	4.1
1936	1,133	5.0	246	4.7
1937	1,113	5.1	238	4.4
1938	1,161	5.4	237	4.6
1939	1,144	5.4	260	5.1
1940	1,145	5.4	253	5.0
1941	1,146	5.4	280	5.3
1942	1,164	5.3	279	5.4
1943	1,150	5.1	241	4.6
1944	1,176	5.0	239	4.7
1944 (2nd session)	1,141	4.6	252	4.9
1945	1,372	5.6	262	5.1
1946	1,868	8.0	242	4.2
1947*	2,183	9.1	342	5.4
1948	2,159	9.5	392	7.1
1949	2,100	8.9	612	12.1
1950	1,806	7.2	595	10.7
1951	1,564	5.9	468	7.6
1952	1,471	5.4	351	5.7
1953	1,463	5.3	363	5.5
1954	1,502	5.3	360	5.2
1955	1,537	5.4	345	4.9

* Includes additional classes.

TABLE 16.—*Military Liability of Male Medical Students, 1954-1955*

	First Yr.	Second Yr.	Third Yr.	Fourth Yr.	Totals
Men with no military liability	1,282	1,130	1,336	1,795	5,543
Men with military liability	5,857	5,589	5,251	4,806	21,503
Total enrollment	7,139	6,719	6,587	6,601	27,046

Study of these tables reveals that what several schools reported as minimal requirements might be better termed usual requirements, since of the eight schools that specified four years of college as a prerequisite to admission, six admitted students with three years of college work. Conversely, of the five schools that admitted only students who had four years of college, three stipulated three years as the minimal requirement. Thus, one might presume that in these instances the usual requirement is four years. This is in keeping with the general practice of medical schools as a group, since 75% of all students in the entering class had had four years of college. Twenty-five per cent had had three years of college study, and no one was admitted with only two years.

TABLE 17.—*Premedical Training of Freshman Students in the United States and Canada, 1954-1955*

	No. of Freshmen	Three Yr. College Training	Four Yr. College Training	No. Holding Degrees	Percentage with Degrees
Medical College of Alabama	82	18	64	63	77.8
University of Arkansas	92	42	50	41	44.6
College of Medical Evangelists	97	1	96	96	99.0
University of Southern California	69	16	53	34	49.3
Stanford University	60	31	29	29	48.3
University of California, San Francisco	77	37	40	33	42.9
University of California, Los Angeles	49	5	44	44	89.8
University of Colorado	85	25	60	51	60.0
Yale University	79	12	67	67	84.8
Georgetown University	108	5	103	103	95.4
George Washington University	102	33	69	69	67.6
Howard University	73	0	73	73	100.0
Emory University	75	23	52	52	69.3
Medical College of Georgia	101	19	82	68	67.3
Chicago Medical School	73	0	73	73	100.0
Northwestern University	130	39	91	79	60.8
Stritch School of Medicine	89	35	54	49	55.1
University of Chicago	72	30	42	60	83.3
University of Illinois	166	83	83	73	44.0
Indiana University	154	87	67	67	43.5
State University of Iowa	120	59	61	59	49.2
University of Kansas	102	21	81	80	78.4
University of Louisville	100	15	85	84	84.0
Louisiana State University	126	48	78	53	42.1
Tulane University	137	55	82	78	56.9
Johns Hopkins University	80	0	80	80	100.0
University of Maryland	88	34	54	49	55.7
Boston University	75	2	73	72	96.0
Harvard Medical School	115	9	106	106	92.2
Tufts College Medical School	112	4	108	108	96.4
University of Michigan	205	90	115	115	56.1
Wayne University	75	28	47	47	62.7
University of Minnesota	127	48	79	44	34.6
University of Mississippi	56	21	35	35	62.5
St. Louis University	125	24	101	90	72.0
University of Missouri	45	16	29	29	64.4
Washington University	87	18	69	64	73.6
Creighton University	76	27	49	46	60.5
University of Nebraska	86	39	47	43	50.0
Dartmouth Medical School	24	23	1	1	4.2
Albany Medical College	64	0	64	64	100.0
University of Buffalo	80	13	67	63	78.7
Columbia University	120	2	118	118	98.3
Cornell University	83	7	76	76	91.6
New York Medical College	128	0	128	126	98.4
New York University	137	15	122	122	89.1
State University of New York, New York City	151	12	139	131	86.8
State University of New York, Syracuse	76	22	54	54	71.1
University of Rochester	72	7	65	65	90.3
University of North Carolina	66	21	45	45	68.2
Duke University	77	21	56	54	70.1
Bowman Gray School of Medicine	54	11	43	43	79.6
University of North Dakota	42	21	21	19	45.3
University of Cincinnati	90	8	82	82	91.1
Western Reserve University	84	1	83	82	97.6
Ohio State University	150	9	141	138	92.0
University of Oklahoma	96	27	69	46	47.9
University of Oregon	78	33	45	37	47.4
Hahnemann Medical College	107	3	104	104	97.2
Jefferson Medical College	175	3	172	172	98.3
Temple University	131	12	119	116	88.5
University of Pennsylvania	130	2	128	124	95.4
Woman's Medical College	51	2	49	49	96.1
University of Pittsburgh	100	5	95	92	92.0
Medical College of South Carolina	79	13	66	60	75.9
University of South Dakota	37	20	17	17	45.9
University of Tennessee	221	121	100	81	36.7
Meharry Medical College	72	1	71	70	97.2
Vanderbilt University	53	23	30	30	56.6
Southwestern Medical School	108	30	78	63	58.3
University of Texas	172	63	109	107	62.2
Baylor University	85	32	53	49	57.6
University of Utah	56	23	33	28	50.0
University of Vermont	52	6	46	43	82.7
University of Virginia	76	4	72	72	94.7
Medical College of Virginia	84	12	72	71	84.5
University of Washington	76	21	55	49	64.5
West Virginia University	32	10	22	20	62.5
University of Wisconsin	82	65	17	17	20.7
Marquette University	103	47	56	52	50.5
University of Puerto Rico	52	10	42	45	86.5
Totals	7,576	1,880	5,696	5,403	71.1

Only a relatively few schools mention the baccalaureate degree as a condition of admission. Of those that do, some specify that the degree must be obtained before

matriculating in medical school, and others make it permissive to obtain the degree any time up to the beginning of the second medical school year. Four schools admitted only students holding degrees at the time of matriculation; and only two of these schools specify this as a requirement. Since 75% of the entering students had had four college years, it is not surprising that 70% held a baccalaureate degree at the time of matriculation. Previous experience indicates that another 15-20% will later acquire the degree, earned on work done in part in the medical school.

COLLEGE RECORD

Table 18 compares the college scholastic record of the entering class of 1954-1955 with that of 1953-1954. It is evident that there has been a small decrease in the number of admitted students with a 3.6-4.0 (A) record with an equivalent increase in the number of students with a 1.0-2.5 (C) record. The college record of this year's class is very similar to that of 1952-1953.

Inquiries addressed to this Council illustrate the need for emphasizing that college academic achievement as measured by scholastic records is only one factor used in the selection of medical students. Over a period of years, most if not all medical schools admit students with an over-all college average of "C" when other factors appear to justify such action.

TABLE 18.—*Comparison of College Record, Freshman Class, 1953-1954 and 1954-1955*

College Grade Average	Percentage of 1953-1954 Freshman Class	Percentage of 1954-1955 Freshman Class
3.6-4.0 (A)	21.1	16.8
2.6-3.5 (B)	68.9	69.0
1.0-2.5 (C)	10.0	14.2

TRANSFER OF STUDENTS FROM SCHOOLS OF BASIC MEDICAL SCIENCES TO FOUR YEAR MEDICAL SCHOOLS

In last year's report data was given showing the medical schools which accepted graduates of the basic medical sciences schools as transfer students with advanced standing. This data covered a five year period (1949-1953) and revealed that all such students during this period were successfully transferred. It is planned to collect similar data every five years, and in the interim students and their faculty advisors in the schools of basic medical sciences are advised to consult the 54th Annual Report on Medical Education.

ATTRITION OF MEDICAL STUDENTS

In the last annual report, a section was devoted to student losses for the academic year 1952-1953. This year it was possible to obtain from the medical schools data on student attrition for the academic year 1954-1955 covered by this report, and it is planned to publish similar current information in succeeding reports so that losses in any given class can be shown throughout the four years that class is in medical school.

Table 19 depicts by class and cause students lost to medicine during 1954-1955. Comparison of these figures with those for 1952-1953 reveals remarkable constancy in the percentage of total losses in each class and the total losses in relationship to the total enrollment for the years concerned.

Two-thirds of all losses were in the first year class and 62% of those losses were due to failure or withdrawal in poor academic standing. In the second year class, losses due to poor academic standing or failure represented 66% of all losses, but, in both the third and fourth year classes, more than two-thirds of the losses were students who withdrew in good academic standing. This discrepancy as to cause of attrition between the first two and last two classes was evident in the previous study, and it again seems valid to point out that withdrawals in good academic standing during the last years of medical school study represent a challenge to improve counseling and perhaps to a need for better sources of financial assistance. Students who are unable to maintain acceptable academic records represent a necessary loss, but those whose academic achievement is satisfactory and who withdraw for other causes in many instances must represent a loss that could and probably should be avoided.

TABLE 19.—*Attrition in the Approved Medical Schools in the United States, 1954-1955*

	Enrollment	Failed	Withdrew, Poor Standing	Withdrew, Good Standing	Totals	Percentage of Enrollment Lost
First year	7,576	290	58	161	419	5.5
Second year	7,104	79	7	45	131	1.8
Third year	6,957	18	1	42	61	0.8
Fourth year	6,946	4	3	17	24	0.3
Totals	28,583	301	69	265	635	

In last year's report a possible relationship between losses due to unsatisfactory scholastic achievement and admission policies imposing geographical restrictions was brought out. Data for 1954-1955 appear to offer further evidence in support of this observation.

Table 20 shows, by type of school ownership, data referable to enrollments, applications, and attrition due to unsatisfactory scholarship for the first year class.

TABLE 20.—*First Year Enrollments, Applications, and Attrition with Poor Scholarship by Type of School Ownership, 1954-1955*

	State or Municipally Owned	Privately Owned
No. of schools *	39	41
Percentage of enrollment	50	50
Percentage of enrollment from out of state	9	53
Percentage of applications	26	74
Percentage of failures and withdrawals in poor academic standing	70	30

* Puerto Rico figures not available.

It can be seen that the total first year enrollment was shared equally by public and private schools. The entering students in public schools were largely residents of the states in which the schools are located; whereas, more than half the students entering private schools were out-of-state residents.

It is also evident that public schools had a much smaller percentage of the total applications to consider in selecting their first year class. Although this appears

to be a valid observation, the discrepancy is modified to some degree by fact that applicants to private schools tend to file more applications than do those to public schools (table 21). Figures in table 20 refer to applications not applicants.

Lastly, it is to be noted that a large percentage of all student failures and withdrawals in poor academic standing occur in the public schools. Certainly there is no proof available that this is directly related to the other data presented. With no evidence to the contrary, however, it does seem reasonable to consider that there is a suggestive relationship between admission policies restrictive on a geographical basis with a smaller population from which to draw first year medical students and a higher incidence of student losses with poor academic records.

THE NEXT ENTERING CLASS

Information currently available suggests that in 1955-1956 there will be little if any significant change in the number of openings available in the first year classes of existing approved medical schools. The Medical School at Miami University is expected to be eligible for approval during the coming year, and figures for its first year as well as all other classes will be included in the next report. The Albert Einstein College of Medicine at Yeshiva University will enroll its first class for the academic year 1955-1956, and subsequently its students will enlarge the number for next year's first year classes.

The number of applicants for the study of medicine has decreased annually for the past five years.[11] It is encouraging to note that the increment of loss this year was considerably less than in the previous four years, so that it may be hoped that a plateau has been reached. If there should be a continuing decrease in the number of applicants for medical schools, it is possible the schools will not be able to fill all available openings with qualified candidates.

GRADUATES

There was again a record number of graduates of approved medical schools in the United States. The 6,977 graduates of this year represent an increase of 1.7% over last year. Almost half of the increase was due to the discontinuation of the required internship at Stanford so that there were two graduating classes at that institution. Approximately one-quarter of the increase was the result of the addition of the class at the newly approved School of Medicine of the University of California at Los Angeles, and the remaining quarter was due to an increase in the size of graduating classes at other schools.

Four medical schools (Tennessee, Michigan, Illinois, and Jefferson) each graduated more than 150 students, and five schools (University of California, Los Angeles; Woman's Medical; Puerto Rico; Vermont; and Vanderbilt) had fewer than 50 students in their graduating classes.

Information in regard to the number of graduates each year since 1930 can be found in table 11. With

11. Stalnaker, J. M., and Dykman, R. A.: The Study of Applicants, Association of American Medical Colleges, to be published.

TABLE 21.—*Number of Completed Applications Acted upon by Each Medical School and the Total Number of Applications Filed by These Applicants, 1954-1955* *

	Size of Freshman Class	Applicants to Each Medical School			Total Applications Filed by Applicants to Each School	Average Number of Applications per Applicant
		Men	Women	Total		
Alabama	83	184	10	194	483	2.5
Albany	64	890	38	928	8,200	8.8
Arkansas	92	135	6	141	221	1.6
Baylor	84	593	35	628	3,930	6.3
Boston	72	847	61	908	7,819	8.6
Bowman Gray	54	457	20	477	3,864	8.1
Buffalo	79	493	22	515	4,230	8.2
California, Los Angeles	50	354	27	381	2,628	6.9
California, San Francisco	76	356	34	390	2,578	6.6
Chicago Medical	73	820	35	855	7,680	9.0
Chicago, University of	72	652	35	687	6,057	8.8
Cincinnati	90	677	25	702	5,104	7.3
Colorado	86	155	13	168	280	1.7
Columbia University College of Physicians and Surgeons	120	1,400	114	1,514	11,184	7.4
Cornell	82	1,226	89	1,315	10,091	7.7
Creighton	76	597	24	621	4,479	7.2
Dartmouth	24	223	3	226	2,085	9.2
Duke	77	546	27	573	4,129	7.2
Emory	75	532	22	554	3,431	6.2
Georgetown	108	789	49	838	6,895	8.2
George Washington	102	852	30	882	6,997	7.9
Georgia	103	202	6	208	426	2.0
Hahnemann	107	1,070	54	1,124	8,504	7.6
Harvard	115	1,002	77	1,139	7,517	6.6
Howard	74	412	32	444	1,954	4.4
Illinois	166	460	32	492	1,898	3.9
Indiana	152	369	18	387	1,489	3.8
Iowa	120	138	6	144	236	1.6
Jefferson	175	1,838	1	1,839	12,196	6.6
Johns Hopkins	79	379	35	414	3,012	7.3
Kansas	101	281	19	300	1,444	4.8
Louisiana	124	289	24	313	1,305	4.2
Louisville	102	195	17	212	753	3.6
Loyola (Stritch)	89	667	24	691	4,569	6.6
Marquette	102	829	47	876	5,746	6.6
Maryland	88	315	16	331	2,200	6.6
Medical Evangelists	98	176	11	187	336	1.8
Meharry	72	408	24	432	1,227	2.8
Michigan	204	464	48	512	2,012	3.9
Minnesota	126	282	16	298	1,271	4.3
Mississippi	57	127	4	131	198	1.5
Missouri	45	113	5	118	393	3.3
Nebraska	86	201	8	209	643	3.1
New York Medical	129	1,683	108	1,791	13,432	7.5
New York University	137	1,295	92	1,387	11,332	8.2
North Carolina	69	208	9	217	822	3.8
North Dakota	42	131	2	133	663	5.0
Northwestern	130	1,505	72	1,577	10,594	6.7
Ohio State	151	399	16	415	1,533	3.7
Oklahoma	96	187	6	193	573	3.0
Oregon	78	288	22	310	1,884	6.1
Pennsylvania	130	1,571	88	1,659	12,095	7.3
Pittsburgh	97	555	23	578	3,400	5.9
Rochester	72	782	39	821	7,147	8.7
St. Louis	120	980	30	1,010	7,275	7.2
South Carolina	79	130	4	134	229	1.7
South Dakota	35	156	7	163	1,150	7.1
Southern California	69	434	24	458	3,406	7.4
Southwestern	105	310	24	334	795	2.4
Stanford	60	421	32	453	3,418	7.5
State University of New York, New York	151	1,162	82	1,244	9,716	7.8
State University of New York, Syracuse	76	713	35	748	6,424	8.6
Temple	130	1,538	83	1,621	11,524	7.1
Tennessee	205	353	25	378	957	2.5
Texas	164	411	29	440	1,010	2.3
Tufts	112	527	45	572	3,733	6.5
Tulane	137	806	41	847	5,742	6.8
Utah	55	270	13	283	1,798	6.4
Vanderbilt	54	652	32	684	5,371	7.9
Vermont	50	221	21	242	1,751	7.2
Virginia, Medical College of	84	305	16	321	1,779	5.5
Virginia, University of	76	384	17	401	2,844	7.1
Washington, St. Louis	87	1,057	52	1,109	8,129	7.3
Washington, University of	75	328	22	350	1,987	5.7
Wayne	75	272	24	296	872	2.9
Western Reserve	84	839	57	896	6,268	7.0
West Virginia	31	86	2	88	241	2.7
Wisconsin	82	151	16	167	455	2.7
Woman's Medical	51	2	157	159	834	5.2
Yale	79	603	45	648	5,221	8.1
Totals	7,549	44,905	2,663	47,568		

* Figures for the University of Miami (68, 135, 8, 143, 521, 3.6) are not included in above calculations. Data on Puerto Rico are not available.

some yearly variation, there has been a gradual increase so that the current graduating class is almost 50% larger than that of 25 years ago.

The third year class of 1954-1955 was slightly smaller than that of the preceding year, now the current graduating class. It is anticipated that the School of Medicine of Miami will be eligible for approval during the academic year 1955-1956 and its students and graduates incorporated in next year's report. Since the graduating class at Miami will not entirely compensate for the difference in size of these two classes, it can be predicted that next year's graduating class will probably be slightly smaller than the one for this year. However, because classes scheduled for graduation in subsequent years are somewhat larger and because of new schools in development, any decrease that does occur will be only an incident in a continuing expanding number of graduates in the years ahead.

Of this year's graduates, 88.6% held baccalaureate degrees at the time of graduation. As first year students, only 70% of the same class had this degree, so that approximately one-sixth of the class earned their college degrees partly on the basis of work completed in medical school.

TABLE 22.—*Students in the Required Intern Year in the United States, 1931-1955*

Yr.	No.	Yr.	No.
1930-1931	1,025	1943-1944	451
1931-1932	1,067	1944 (2nd session)	447
1932-1933	1,106	1944-1945	452
1933-1934	1,183	1945-1946	488
1934-1935	1,233	1946-1947 *	582
1935-1936	1,213	1947-1948	447
1936-1937	1,255	1948-1949	458
1937-1938	1,132	1949-1950	454
1938-1939	1,152	1950-1951	501
1939-1940	1,152	1951-1952	379
1940-1941	1,058	1952-1953	407
1941-1942	767	1953-1954	203
1942-1943	639	1954-1955	50

* Includes additional classes.

REQUIRED INTERN YEAR

The trend toward abandoning the internship as a requirement for graduation was brought out in last year's report and is illustrated in table 22. In 1954-1955 only Stanford continued to require an internship for graduation, and it has made the decision to eliminate this requirement and award the medical degree at the successful completion of four years of medical school study. Thus, after this year, there will be no students serving internships as a prerequisite to graduation.

Almost all new graduates continue to serve internships, and there is no indication that the elimination of this as a requirement of the medical schools for graduation has produced any trend away from the internship as a step in the medical education process.

STUDENT FEES

Fees for resident and nonresident students charged by each medical school are listed in table 1. During the year covered by this report, the average tuition fee for resident students was $646 and for nonresident students was $807. Comparable figures for last year were $633 and $722.

SCHOLARSHIP AND LOAN FUNDS IN UNITED STATES MEDICAL SCHOOLS

Seventy-one of the 81 medical schools in the United States have either student scholarship or loan funds, or both, available. Since the report of last year covering the 1953-1954 academic session, 10 schools have increased their total available scholarship funds by $108,200. Eleven schools have augmented loan funds by $202,330. Thus, for 1954-1955, 71 schools had a total of $1,151,760 available for student scholarships and $2,332,170 for loans.

Three of the schools received additional scholarship funds in excess of $20,000 for the year. One of the state university medical schools received additional loan funds of $100,000 for the year.

The Council on Rural Health of the American Medical Association has prepared a brochure on the medical scholarship and loan fund programs available only to the residents of the 17 sponsoring states including Alabama, Connecticut, Georgia, Idaho, Illinois, Iowa, Kansas, Kentucky, Michigan, Minnesota, Mississippi, Missouri, Nebraska, Ohio, Pennsylvania, South Dakota, and Wisconsin. This brochure itemizes the scholarship and loan funds sponsored or administered by state and county medical societies, women's auxiliaries, joint medical society and state boards, and special organizations. It does not include medical school grants, state scholarships and loans not connected with medical societies, and private endowments.

What Happens to Medical School Graduates?

NEW STUDY BY BUREAU OF MEDICAL ECONOMIC RESEARCH

In connection with the tabulation of statistical data, the Bureau of Medical Economic Research of the American Medical Association has accumulated vast quantities of information of interest and value in the field of medical education. It maintains a continuous census of physicians on punch cards coextensive with the files of the Directory Department. That Department has great difficulty in keeping abreast of the changes in addresses and type of practice of American physicians. Some interns, for example, are not reclassified until many months after completing their internships because of their delay in notifying the Directory Department.

Last year the Bureau of Medical Economic Research published Bulletin 94, Distribution of Physicians by Medical Service Areas, as a result of its six year cooperative study with the state medical societies. It was necessary to relate all data to April, 1950, the effective date of the 1950 United States Census of Population, in computing population-physician ratios. Since the code numbers for the medical school and the year of graduation were punched into each of the 205,000 cards for the physicians living in the 48 states and the District of Columbia, the Bureau decided to sort the cards by school and prepare approximately 500 tables. In 7 of the 11 groups of tables there are 72 separate tables, one for each of the 72 schools approved at that time. This statistical study of the medical school alumni will be published in Bureau of Medical Economic Research

Publication M-94 in the fall of 1955. It will present for the first time a comprehensive picture of the distribution of the alumni of each of the 72 United States approved (as of April, 1950) four year medical schools and of the 72 schools as a group, by type of practice, by state, by size of city, and by year of graduation and some similar data for three groups of schools—other United States schools (184), the Canadian schools (13) and foreign schools (226). A follow-up study for 1956 is being planned, which will probably include additional data on specialization and data on the alumni of approved United States medical schools residing in Canada and the United States possessions, in addition to those residing in the states.

Table 23 is the first or basic table of this forthcoming study and is presented in this issue of THE JOURNAL to acquaint medical educators with the potentialities inherent in the report. The type-of-practice distributions by four groups of schools are shown in three parts. (Limitations on these type-of-practice data cannot be set forth herein, they will be described fully in the forthcoming Bureau publication.) Part A deals with numbers; part B with percentage distribution by school grouping; and part C with percentage distribution by type of practice. Of the 205,000 physicians, 164,409, or 80.2%, were graduates of the 72 United States approved four year schools, 13.2% were graduates of other United States schools, 2.0% of Canadian schools, and 4.6% of foreign schools. These four over-all percentages are the basic frame of reference for comparisons. (The 214 early graduates of some of the seven approved two year schools were included among the 27,066 total for other United States schools.) It is anticipated that the percentage for foreign schools will be higher in the 1956 survey.

Of the 76,158 general practitioners in April 1950, only 56,000, or 73.5%, were graduates of the 72 approved United States four year schools; of all physicians, less than 80.2% were graduates of the approved schools. On the other hand, the graduates of the other United States schools accounted for 18.8% of the general practitioners, but only 13.2% of the total physicians. (Some of the tables in the forthcoming Bureau of Medical Economic Research Publication M-94 will show that these graduates were older and less concentrated in the large cities.)

Similar comparisons can be made from the percentages in part B for the other types of practice. For example, the graduates of the 72 approved four year schools accounted for 84.2% of the full-time specialists, relatively more than the 80.2% of all physicians. The graduates of the Canadian schools accounted for a relatively larger proportion of full-time specialists, 2.4% versus 2.0% of all physicians, and a relatively small proportion of the general practitioners, 1.8% versus 2.0%. The pattern for the foreign school graduates in this regard follows somewhat the pattern of the graduates of other United States schools, namely, a relatively larger proportion of general practitioners, 5.9% versus 4.6%. Considerably above the over-all percentage of 80.2%, 88.1% of the full-time medical school staff members were graduates of the 72 approved United States four year schools. As might be expected, an inordinately high percentage, 34.6%, of the retired and not in practice group were graduates of other United States schools, a fact which indicates, of course, that many of them were in the higher age brackets.

TABLE 23.—*Type-of-Practice Distribution by School Groupings*

Type of Practice * (1)	Approved U.S. 4 Yr. Medical Schools (2)	Other U.S. Medical Schools (3)	Canadian Medical Schools (4)	Foreign Medical Schools (5)	Total (6)
A. Number					
1. General practitioners	56,000	14,278	1,381	4,499	76,158
2. Part-time specialists	18,341	3,261	451	1,207	23,260
3. Full-time specialists	48,022	5,057	1,398	2,557	57,034
1-2-3. Active private practice	(122,363)	(22,596)	(3,230)	(8,263)	(156,452)
4. Administration, research, industry, local government	813	108	41	52	1,014
5. Full-time medical school staff	1,558	84	51	76	1,769
6. Federal government	9,156	542	130	415	10,243
7. Retired and not in practice	6,366	3,604	215	237	10,422
8. Interns	8,612	12	117	42	8,783
9. Residents	15,541	120	336	310	16,307
Total physicians	164,409	27,066	4,120	9,395	204,990
B. Percentage Distribution by School Groupings					
1. General practitioners	73.5%	18.8%	1.8%	5.9%	100.0%
2. Part-time specialists	78.9	14.0	1.9	5.2	100.0
3. Full-time specialists	84.2	8.9	2.4	4.5	100.0
1-2-3. Active private practice	(78.2)	(14.4)	(2.1)	(5.3)	(100.0)
4. Administration, research, industry, local government	80.2	10.7	4.0	5.1	100.0
5. Full-time medical school staff	88.1	4.7	2.9	4.3	100.0
6. Federal government	89.4	5.3	1.3	4.0	100.0
7. Retired and not in practice	61.1	34.6	2.0	2.3	100.0
8. Interns	98.1	0.1	1.3	0.5	100.0
9. Residents	95.3	0.7	2.1	1.9	100.0
Total physicians	80.2	13.2	2.0	4.6	100.0
C. Percentage Distribution by Type of Practice					
1. General practitioners	34.1%	52.8%	33.5%	47.9%	37.2%
2. Part-time specialists	11.1	12.0	11.0	12.9	11.3
3. Full-time specialists	29.2	18.7	33.9	27.2	27.8
1-2-3. Active private practice	(74.4)	(83.5)	(78.4)	(88.0)	(76.3)
4. Administration, research, industry, local government	0.5	0.4	1.0	0.6	0.5
5. Full-time medical school staff	0.9	0.3	1.2	0.8	0.9
6. Federal government	5.6	2.0	3.2	4.4	5.0
7. Retired and not in practice	3.9	13.3	5.2	2.5	5.1
8. Interns	5.2	0.1	2.8	0.4	4.3
9. Residents	9.5	0.4	8.2	3.3	7.9
Total physicians	100.0	100.0	100.0	100.0	100.0

* Definitions used in these nine classifications and limitations on the source data, particularly on interns and residents, are found in Bureau of Medical Economic Research Publication M-94.

In part C, 100.0% represents the total for the graduates of each of the four groups of schools with the percentage distribution of the four groups combined in the right-hand column. Of the total physicians, 37.2% were general practitioners, while of the alumni of the 72 United States approved four year schools 34.1% were general practitioners, as were 52.8% of the alumni of the other United States schools, 33.5% of the alumni

of the Canadian schools, and 47.9% of the alumni of the foreign schools. An atypically low percentage (18.7% versus 27.8%) and an atypically high percentage (33.9% versus 27.8%) of the alumni of the other United States schools and Canadian schools respectively were full-time specialists.

The Bureau of Medical Economic Research indicated that further observation based on this single table would raise more questions than they could or would be able to answer. The forthcoming study Bureau of Medical Economic Research Publication M-94 will contain much information of interest to medical educators. The comparative data that is being prepared for each of the approved medical schools (as of April, 1950) will be of particular value. Only one copy will be available to each medical school, as only 100 copies will be planographed.

Medical Education and National Defense

CURRENT STATUS

The Joint Committee on Medical Education in Time of National Emergency, representing the Council on Medical Education and Hospitals of the American Medical Association and the Association of American Medical Colleges, has continued to collaborate as closely as possible with the Department of Defense, the armed forces, the Selective Service System, the Public Health Service, the Civil Administration, and other governmental agencies in considering problems created for medical education by the continuing defense needs of the nation.

The Council on Medical Education and Hospitals and the American Medical Association as well as the Association of American Medical Colleges supported the legislative proposals in regard to the development of medical military scholarships. The concept of medical military scholarships, however, has not received congressional support. Some members of Congress apparently favor the establishment of a military medical academy or school rather than the support of medical military scholarships, unless the latter involves a definite commitment for increased undergraduate student enrollment.

The program for medical education and national defense (MEND) has been given additional support and will be extended. A full-time national coordinator for the program has been appointed with offices maintained in the Bureau of Medicine and Surgery, Department of the Navy, Potomac Annex, Washington, D. C.

Following the two year pilot study program at the colleges of medicine of Cornell, Buffalo, Vanderbilt, Illinois, and the University of California at San Francisco, the MEND program has been extended to ten additional schools. This additional list includes Baylor, Colorado, Emory, Georgetown, Medical College of Virginia, Ohio State, Pennsylvania, Tufts, Washington at Seattle, and Wisconsin. Ten more schools are to be added in January, 1956.

MEND is a function of the Joint Committee on Medical Education in Time of National Emergency, representing the Council on Medical Education and Hospitals of the American Medical Association and the Association of American Medical Colleges. Its program has been endorsed by both parent organizations, as well as by the medical officials of the Department of Defense, Public Health Service, and Federal Civil Defense Administration.

The purpose of the program is to encourage the teaching of principles of military and disaster medicine by regular faculty members of the medical colleges. Nothing is mandatory, each faculty is free to accept or reject any part of the program not consistent with the local philosophy of medical education. All emphasis is on medical rather than military topics.

Features of the program include symposiums for the faculties of participating institutions sponsored by the MEND committee. During 1955-1956, a three day session on aviation physiology and medicine will be conducted by the Air Force at Randolph Field, Texas, in October. Later symposiums will include infectious diseases, chemical, biological, and radiological warfare defense, and surgery of trauma. Faculty members are offered opportunities to visit research installations of the federal services to learn of recent developments in military areas of activity.

SELECTIVE SERVICE SYSTEM AND DEFERMENT ELIGIBILITY

The responsibility for primary classification of registrants rests with selective service local boards. If a person or his employer (college, medical school, or hospital) has requested his deferment and he has been classified as available for military service, the person or his employer may, within ten days of the mailing of the notice of classification, file an appeal. If the State Appeal Board should sustain the classification, the registrant or his employer may, if there is a dissenting vote in the appeal board, file a written request with the local board to have the decision appealed to the National Selective Service Appeal Board. If there is no dissenting vote, the state or national director of selective service may appeal the case to the President.

The "college student certificate," SSS Form 109, continues to be prescribed for the use of institutions of higher learning, including those of medicine, in furnishing the local boards information regarding registrants who are enrolled as students in those institutions. These forms should be submitted to the local boards by the educational institution on request of the registrant. However, the mere filing of such a form does not constitute a request for occupational deferment, since, in order to establish the right of appeal as an interested party, a written request from the college or employer for occupational deferment must accompany the form. The registrant has the right of appeal if exercised in the prescribed ten days. He may make his appeal informally in writing.

ELIGIBILITY FOR CONSIDERATION FOR DEFERMENT

The law empowers the President to provide for the deferment of any person whose deferment is equitable and in the national interest. Furthermore, it is the sense of Congress that provision should be made for the annual deferment from training and service of premedical, pre-

dental, and allied preprofessional students in numbers equal to those at present in attendance at colleges and universities as outlined in the general student deferment program. The President is also directed to establish a national advisory committee to advise the Selective Service System and assist state and local advisory boards in selecting the needed medical, dental, and allied personnel.

Sections 1622:15 and 1622:25 of the Selective Service Regulations specify the conditions under which students pursuing programs of higher education may be considered for deferment. Within these specified requirements, students of the healing arts are considered for deferment in the same manner as students pursuing other undergraduate or graduate courses at colleges, universities, and similar schools.

Any student not previously deferred who is pursuing a full-time course of study is entitled to a single period of statutory deferment, Class 1-S, until the end of the academic year. Such deferment does not preclude the possibility of later deferment in Class 2-S. Students whose activity in study, research, medical, or other endeavors is found necessary to maintenance of the national health, safety, or interest may be deferred in Class 2-S until completion of their training, provided they maintain satisfactory scholastic records. A student who is deferred for study extends his liability for military training and service up to his 35th birthday instead of his 26th as prescribed for registrants who have never enjoyed a deferment.

In selecting a student for deferment in Class 2-S, the Selective Service local boards may, at their discretion, be guided either by the score made by the student on the Selective Service College Qualification Test or by his record of academic performance.

The College Qualification Test is given for the Selective Service System by the Science Research Associates, Inc., of Chicago. At present, in order to be eligible for deferment on the basis of this test, an undergraduate student must make a score of 70 or more. SSS Form 108 has been prescribed for furnishing to the local board the score made on this test. This score is confidential and may be divulged by the local board only to the registrant or one holding his written consent.

To qualify for deferment on the basis of academic performance, the nonprofessional student must have maintained the following standing among the male members of his class; freshman year, upper one-half; sophomore year, upper two-thirds; junior year, upper three-fourths.

A student accepted for admission to medical school after July 1, 1951, for the class next commencing may be deferred provided that, during his last full-time year at a college or university, he was ranked among the upper one-half of the male members of his class or had a score of 70 or more on the Selective Service College Qualification Test.

A student accepted for admission by a graduate school after July 1, 1951, as a full-time student for the class next commencing may be deferred provided in his last full-time academic year in a college or university he achieved a scholarship standing among the upper one-half of the male members of his class or scored 75 or more on the qualification test and provided the graduate school certifies that he is meeting the degree requirements.

Decisions concerning deferment of American students enrolled in foreign universities, including medical students, are the responsibility of the local boards. The local board may accept or reject any claims or evidence presented for deferment.

STATUS OF INTERNS AND RESIDENTS

The Selective Service System has always recommended the deferment of graduates of medicine to complete one year of internship training. Recently, and in order to prevent calling up men of priority 3 who are in the higher age brackets, Selective Service has stated that men to be given favorable consideration for deferment to complete a residency or more than one year of internship, should be absolutely essential to the operation or maintenance of the hospitals where they are employed. Selective Service is of the opinion that there is a sufficient number of priority 4 young men to fill the needs of hospitals for residents.

For the fiscal year 1956 (July 1, 1955-June 30, 1956), the National Advisory Committee to the Selective Service System has agreed to request that local boards defer 300 men who finish their internships on or about June 30, 1955, for the purpose of residency training in some specialty. These 300 men are all to be commissioned in the reserve component of one of the armed forces, and they are to be selected by the Assistant Secretary of Defense (Health and Medical) for such training. The request for deferment is to pass from the individual to the Assistant Secretary of Defense (Health and Medical) and then, if recommended, will be forwarded through national headquarters of the Selective Service System to the respective local boards of that system. This program may be continued in subsequent years. The number of such requested deferments is to be determined year by year.

The National Advisory Committee to the Selective Service System has indicated that all physicians in priority 1 and priority 2 and those in priority 3 born after August 30, 1922, will be needed by the armed forces and has advised that they apply for commissions about the time of completion of their internships. A few persons in these categories may be recommended for deferment by the Selective Service local boards for teaching, research, or public health or because they are rendering essential service in isolated communities and cannot be replaced.

In addition, the only persons in this group who can justifiably be recommended for deferment are those who are accepted for training in the scarcity specialties and whose services are required to meet the essential needs of medical and dental schools or hospital services. The specialties in which critical shortages exist are anesthesiology, physical medicine and rehabilitation, psychiatry, radiology, neurology, pathology, public health, orthopedic surgery, oral surgery, and the basic medical

sciences. Those few persons in these groups for whom deferment is necessary may be deferred in Class 2-A by the Selective Service local boards. The recommendation of the advisory groups in all such cases is desirable.

STATUS OF FACULTY MEMBERS

Since the majority of the faculty members of medical schools are under 50 years of age, they are required to register with the Selective Service System as indicated under Public Law 779. No policy has been announced by the Selective Service System on the granting of deferment to faculty members, except that recently teachers of medicine have been mentioned in a Selective Service operations bulletin as being in a critical occupation to which local boards should give special consideration. The National Advisory Committee has recommended that, as a general policy, essential members of medical, dental, and veterinary faculties be held in their teaching positions until such time as replacements are found. This recommendation applies especially to persons in the basic sciences departments and includes persons in priorities 1 and 2. This policy is not a blanket recommendation for deferment from military service for all teachers. Part-time teachers, who devote only a small portion of their time to teaching, and certain of the younger full-time teachers in priorities 1 and 2 will be expected to enter the military services.

CURRENT STATUS OF THE "DOCTOR-DRAFT" LAW

The "Doctor-Draft" law was first approved Sept. 9, 1950, as Public Law 779, 81st Congress, an amendment to the Universal Military Training and Service Act. It has subsequently been amended by Public Law 84, 83rd Congress, approved June 19, 1953; Public Law 403, 83rd Congress, approved June 18, 1954; and Public Law 118, 84th Congress, approved June 30, 1955. These amendments, which have been included as Section 4(i) of the Universal Military Training and Service Act, are known as the "Doctor-Draft" law.

The effective date of the Universal Military Training and Service Act, as now amended, is extended to July 1, 1959, while that part pertaining to the registration and induction of physicians, dentists, and allied specialists ("Doctor-Draft" law) is extended to July 1, 1957. No change was made in the age limit prescribed in the previous amendments which required that all physicians, dentists, and allied specialists under the age of 50 must register with the Selective Service System local boards when required to do so by the proclamation of the President. Therefore, all new medical graduates under the age of 50 must register with their Selective Service local boards as physicians, regardless of any previous registration, within five days of the receipt of the Degree of Doctor of Medicine, provided they do not hold a commission in an armed forces reserve component. However, Public Law 118, of the 84th Congress, did relieve any physician who had attained the 46th anniversary of his birth from liability of induction. When the degree is not granted by the school until completion of an internship, this special registration is accordingly deferred.

As under previous provisions of the act, registrants will be arranged in four priorities signifying the order of induction. However, the criteria for such an arrangement under these priorities have been modified. The major changes enacted by the new amendments are those which provide for greater recognition of prior military service. A registrant will now receive credit for all service performed as either an officer or enlisted man since Sept. 16, 1940, regardless of whether it was before or after participation in an AST or V-12 program, or deferment by the Selective Service System for professional education prior to March 31, 1947. Also, recognition is given for military service performed in the armed services of a country allied with the United States prior to Sept. 2, 1945, while so allied.

Whereas, formerly physicians who were educated in part or in whole at government expense or were deferred by the Selective Service System while completing their professional education needed 21 months of service to qualify for assignment in priority 4, they now need only 17 months. As a result of this change, a number of physicians formerly in priorities 1 and 2 have been reassigned in priority 4. The periods of service for men called to active duty or inducted under the new law were also revised. Those with 9 months or less of service must serve 24 months. Those with 9 to 12 months will serve 21 months. Those with 12 to 15 months' service will serve 18 months, and those with 15 to 21 months will serve 15 months. Those physicians in priority 4 who have had 21 months or more of service since Sept. 16, 1940, are not liable to induction or recall, except in time of war or national emergency declared by Congress.

"Active service" and "active duty" are defined as full-time duty since Sept. 16, 1940, in the service of the United States Army, Navy, Air Force, Marine Corps, Coast Guard, or Public Health Service, including reserve components; time spent during World War II by conscientious objectors in work of national importance; service performed before Sept. 2, 1945, in the armed forces of countries that were allies of the United States during World War II; and service performed as a physician or dentist for the Panama Canal Health Department between Sept. 16, 1940, and Sept. 2, 1945.

Specifically excluded from consideration as "active service" is time spent in V-12 or AST programs in military internships, residencies, or senior student programs, time spent in military service for the sole purpose of undergoing physical examination, and training entered into after June 29, 1953. The law continues to permit deferment of those persons whose activities are essential to the national health, safety, or interest.

It is the duty of the National Advisory Committee and the voluntary state and local committees of the Selective Service System to make recommendations to the Selective Service System concerning the essentiality or availability of special registrants who are being classified by their local boards. This duty includes recommendations concerning residents, faculty members, and those engaged in essential laboratory and clinical research.

Public Law 403, approved June 18, 1954, amended the so-called "Doctor-Draft" law and makes it possible

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for the armed forces to return to duty, but in enlisted status, persons serving under the "Doctor-Draft" law whose loyalty is questioned or for security reasons. This amendment, therefore, removed the mandatory requirement of Public Law 84 that physicians and dentists be given commissions.

The latest amendment, Public Law 118, 84th Congress, provides that if any physician special registrant, after attaining the 35th anniversary of the date of his birth, applies or has applied for a commission in one of the armed forces as such and is or has been rejected for commission on the sole grounds of physical disqualification, he is not liable for induction.

Role of Medical Schools in Graduate and Continuation Education

As knowledge in the field of science applicable to teaching, research, and the practice of medicine continues to increase with accelerating rapidity the potential role of medical schools in the field of continuation education becomes more apparent and more important. Many years ago John Chalmers De Costa wrote to the effect that: "Each one of us, however old, is still an undergraduate in the school of experience. When a man thinks he has graduated he becomes a public menace." In the dynamic field of medicine no individual who teaches or practices can ever cease seeking further knowledge, learning new techniques, and developing the wisdom to utilize them effectively.

Over the past several years the Council on Medical Education and Hospitals has endeavored to assist physicians in their search for opportunities in continuation education through the semiannual listing of courses, clinics, and other activities planned and scheduled by medical schools, hospitals, medical societies, specialty organizations, and clinics. Beginning this year the list will be an annual presentation covering the period from Sept. 1 to Aug. 31 of the succeeding year. The first annual listing appeared in the July 23, 1955, issue of THE JOURNAL. Supplementary listings will appear from time to time, the first one represented by table 24 in this publication.

All medical schools conducting programs of undergraduate medical education are also naturally involved in graduate medical education through either direct administrative responsibility or through activities of their faculty personnel in the planning and supervision of graduate students, interns, and residents. This area of medical school responsibility has steadily increased over the years. In many institutions undergraduate and graduate medical education are intimately interwoven. Faculty, interns, and residents participate in the supervision of student clinical clerks, and in some institutions the latter are considered to be junior components of the medical team as they conduct their clinical assignments.

INTERNSHIPS AND RESIDENCIES

In the current list of approved internships and residencies in THE JOURNAL (Sept. 24, 1955) an analysis was made of internships based on the participation of the hospital in undergraduate medical education. This is summarized in table 25. It was indicated that 213 hospitals approved for internships (25% of the 850 so approved) were designated as either major (140) or minor (73) teaching hospitals in their medical school relationship. The 140 major teaching hospitals offered 4,017 (36%) of the total approved internships (11,048) and the 73 minor teaching affiliations accounted for 849 (7.7%). Thus 43.7% of all of the approved internships were in institutions affiliated with medical schools where faculty personnel were directly involved in the supervision and conduct of training programs. Eighty-five per cent of the internships in major teaching hospitals, 81% of those in minor teaching hospitals, and 80% of approved internships in nonaffiliated hospitals were filled last year.

The current list of approved internships and residencies indicates that in 1954-1955 there were 25,486 residencies available at all levels, of which 20,494 (80%) were filled. An exact analysis of the number of residents in medical school affiliated hospitals as compared to those in nonaffiliated institutions is not available. However, it is fair to assume that medical school faculty personnel carry a heavy load of responsibility for planning and supervising graduate medical education at the residency level.

INCREASING INTEREST IN THE INTERNSHIP

During recent years increasing attention has been centered on the internship by members of the medical profession and hospital administrators as well as by medical educators. On several occasions the House of Delegates of the American Medical Association has appointed special committees to study the internship. The most recent of these committees was the Ad Hoc Committee, which after thorough study reported its findings and recommendations to the House of Delegates during the past year (December, 1954, and June, 1955). This committee clearly upheld the primary educational function of the internship in its final recommendations. At the June, 1955, meeting of the House of Delegates of the American Medical Association, two resolutions were approved which publicly recorded professional support of the educational objective of the internship. One of these resolutions is of such general importance as an expression of professional opinion as to the nature of the internship that it is recorded, herewith:

WHEREAS, Different ideas concerning the purpose of the internship have led to confusion as to what should be its proper content of experience and its proper place in the field of hospital organization and in the general scheme of medical education; and

WHEREAS, It seems desirable that the medical profession through action of the House of Delegates, should take clarifying action to establish publicly its attitude toward these matters;

THEREFORE BE IT

Resolved, It is the sense of the House of Delegates that the following principles be given general recognition:

First, that the internship in fact combines two functions, (1) as an educational period in the training of young physicians and (2) as a position rendering medical care and service to patients in hospitals and assistance to the staffs of the hospitals.

TABLE 24.—*Postgraduate Courses for Physicians*

(Supplemental listing to compilation of Postgraduate and Graduate Courses for Physicians published in THE JOURNAL, July 23, 1955, pp. 1052-1131.)

Type: R—Refresher; S—Special
Designed for: G—General Practitioners; S—Specialists; B—All Physicians
Time Arrangements: C—Concentrated, full time; I—Intermittent

Postgraduate Instruction for Physicians—Sept. 1, 1955, to Aug. 31, 1956

Course Code No.	Title of Course	Location of Course	Type	Designed for	Total Hours	Methods of Instruction	Starting Date	Time Arrangements	Fee in Dollars
		ANESTHESIOLOGY							
P 04414	Short Course in Anaesthesia,[1, 2, 3]	Victoria General Hospital Tower Road Halifax, Nova Scotia	R	G	26	Clinical case work Lecture or panel	2/27/56	C; 4 days	20
		CARDIOVASCULAR DISEASE							
P 04546	Electrocardiography [3]	University of California School of Medicine Los Angeles	R	G	15	Lecture or panel	3/20/56	C; 15 hr.	50
		DERMATOLOGY							
P 02939	Dermatology in General Practice [3, 16]	University of California School of Medicine Los Angeles	R	G	12	Clinical case work Lecture or panel	11/ 9/55	I; 2 hr. weekly for 6 wk. Wednesdays	30
P 02940	Dermatology in General Practice [3, 20]	University of California School of Medicine Los Angeles	R	G	12	Clinical case work Lecture or panel	2/15/56	I; 2 hr. weekly for 6 wk. Wednesdays	30
P 04417	Symposium in Dermatology [1, 2, 3]	Victoria General Hospital Tower Road Halifax, Nova Scotia	R	G	13	Lecture or panel	4/9/56	C; 2 days	10
		GENERAL MEDICINE							
P 02933	Aviation Medicine	University of California School of Medicine Los Angeles	S	G	21	Lecture or panel	10/25/55	C; 3 days	50
P 02122	Medicine for Today [3, 27, 28]	St. James Hospital Chicago Heights, Ill.	R	G	24	Lecture or panel	10/ 4/55	I; 2 hr. weekly for 12 wk. Tuesdays	40
P 02123	Medicine for Today [3, 27, 28]	Wabash General Hospital Mt. Carmel, Ill.	R	G	24	Lecture or panel	10/ 6/55	I; 2 hr. weekly for 12 wk. Thursdays	40
P 03722	Recent Advances in General Medicine [3, 21, 22]	University of Cincinnati College of Medicine Eden and Bethesda Aves. Cincinnati 19	R	G	12	Lecture or panel	10/ 6/55	I; 3 hr. weekly for 4 wk. Thursdays	10
P 03723	Rehabilitation in Chronic Diseases [3, 21, 22]	Sheltering Oaks 408 Union St. Cincinnati	R	G	5	Lecture or panel	11/27/55	C; 5 hr.	10
P 05022	Bridgewater Regional Course [1, 3, 7]	Selected center in Bridgewater, Nova Scotia	R	G	15	Lecture or panel Demonstration	11/55	I; 3 hr. weekly for 5 wk. Fridays	10
P 04024	Kentville Regional Course [1, 3, 7]	Selected center in Kentville, Nova Scotia	R	G	18	Lecture or panel Demonstration	3/56	I; 3 hr. weekly for 6 wk. Wednesdays	10
P 05025	New Glasgow Regional Course [1, 3, 7]	Selected center in New Glasgow, Nova Scotia	R	G	15	Lecture or panel Demonstration	4/56	I; 3 hr. weekly for 5 wk. Fridays	10
		GYNECOLOGY							
P 04413	Week in Obstetrics, Gynecology and Pediatrics [1, 2, 5, 6]	Victoria General Hospital Halifax, Nova Scotia Grace Maternity Hospital Halifax, Nova Scotia Children's Hospital Halifax, Nova Scotia	R	G	31	Clinical case work Operative surgery	11/21/55	C; 5 days	25
P 05027	Short Course in Obstetrics and Gynecology [4]	Selected center in Nova Scotia	R	G	Unknown	Unknown	5/17/56	C; 2 days	Unknown
		INDUSTRIAL MEDICINE							
P 02773	Application of Principles of Industrial Medicine to Private Practice [3]	University of California School of Medicine Los Angeles	S	G	18	Lecture or panel	10/19/55	I; 2 hr. weekly for 9 wk. Wednesdays	50

INTERNAL MEDICINE								
P 03828	Physiological Basis of Internal Medicine [3, 11, 12, 13]	Duke University School of Medicine Durham, N. C.	S	S	40	Lecture or panel	10/10/55	C; 5 days	30 to members
P 04416	Week in Medicine [1, 2, 3, 4]	Victoria General Hospital Tower Road Halifax, Nova Scotia	R	G	34	Clinical case work Lecture or panel	3/26/56	C; 5 days	25
MALIGNANT DISEASE								
P 02488	Midwest Cancer Conference [8, 9, 10]	Hotel Broadview Wichita, Kan.	R	B	15	Lecture or panel Demonstration	3/22/56	Specially arranged	Nil
NEUROLOGY								
P 03724	Neuro-Psychiatry [3, 21, 22]	Hotel Gibson Cincinnati	R	G	4	Lecture or panel	1/22/56	C; 4 hr.	10
OBSTETRICS								
P 01906	Obstetrics [3, 17]	University of California Riverside Campus Riverside, Calif.	R	G	6	Lecture or panel	10/ 5/55	C; 1 day	17.50
P 04413	Week in Obstetrics, Gynecology and Pediatrics [1, 3, 5, 6]	Victoria General Hospital Halifax, Nova Scotia Grace Maternity Hospital Halifax, Nova Scotia Children's Hospital Halifax, Nova Scotia	R	G	31	Clinical case work Operative Surgery	11/21/55	C; 5 days	25
P 05027	Short Course in Obstetrics and Gynecology [1]	Selected center in Nova Scotia	R	G	Unknown	Unknown	5/17/56	C; 2 days	Unknown
OPHTHALMOLOGY								
P 01305	Postgraduate Series in Ophthalmology	Yale University School of Medicine 333 Cedar St. New Haven, Conn.	R	S	10	Lecture or panel	11/18/55	I; 1 hr. every 2 wk. for 5 mo. Fridays	15
P 03799	Postgraduate Convention of the Oregon Academy of Ophthalmology and Otolaryngology	University of Oregon Medical School 3181 S.W. Sam Jackson Park Rd. Portland 1, Ore.	R	B	15	Lecture or panel Demonstration	3/19/56	C; 2½ days	85
P 03800	Postgraduate Convention of the Oregon Academy of Ophthalmology and Otolaryngology	University of Oregon Medical School 3181 S.W. Sam Jackson Park Rd. Portland 1, Ore.	R	B	15	Lecture or panel Demonstration	3/23/56	C; 2½ days	85
P 04283	Virginia Society of Ophthalmology and Otolaryngology —Clinical Session [3, 24, 25, 26]	Medical College of Virginia Box 25, 1200 E. Broad St. Richmond 19, Va.	R	B	32	Lecture or panel	11/29/55	C; 4 days	35
OTOLARYNGOLOGY								
P 03729	Twentieth Annual Graduate Convention in Otology, Rhinology, and Laryngology [23]	University of Cincinnati College of Medicine Eden and Bethesda Aves. Cincinnati 19	S	S	45	Laboratory work Operative surgery	4/16/56	C; 5½ days	150
P 03799	Postgraduate Convention of the Oregon Academy of Ophthalmology and Otolaryngology	University of Oregon Medical School 3181 S.W. Sam Jackson Park Rd. Portland 1, Ore.	R	B	15	Lecture or panel	3/19/56	C; 2½ days	85
P 04283	Virginia Society of Ophthalmology and Otolaryngology—Clinical Session [3, 24, 25, 26]	Medical College of Virginia Box 25, 1200 E. Broad St. Richmond 19, Va.	R	B	32	Lecture or panel	11/29/55	C; 4 days	35
PATHOLOGY								
P 04545	General Surgical Pathology [3]	University of California School of Medicine Los Angeles	R	G	36	Laboratory work Lecture or panel	11/12/55	I; 4 hr. weekly for 9 wk. Saturdays	80
PEDIATRICS								
P 02935	Pediatrics [3]	University of California School of Medicine Los Angeles	R	G	15	Lecture or panel	10/27/55	C; 3 days	50
P 04413	Week in Obstetrics, Gynecology and Pediatrics [1, 3, 5, 6]	Victoria General Hospital Halifax, Nova Scotia Grace Maternity Hospital Halifax, Nova Scotia Children's Hospital Halifax, Nova Scotia	R	G	31	Clinical case work Operative surgery	11/21/55	C; 5 days	25
P 05023	Short Course in Pediatrics [1]	Selected center in Nova Scotia	R	G	Unknown	Unknown	5/14/56	C; 3 days	Unknown

TABLE 24.—*Postgraduate Courses for Physicians*—Continued

Course Code No.	Title of Course	Location of Course	Type	Designed for	Total Hours	Methods of Instruction	Starting Date	Time Arrangements	Fee in Dollars
			PHYSIOLOGY						
P 04550	Pathological Physiology [3, 14]	University of California School of Medicine Los Angeles	R	G	24	Lecture or panel Demonstrations	2/20/56	I; 2 hr. weekly for 12 wk. Mondays	50
			PSYCHIATRY						
P 04554	Treatment of Emotional Problems in Office Practice—Basic Course [3, 14]	University of California School of Medicine Los Angeles	R	G	20	Small group discussion Lecture or panel	2/ 9/56	I; 2 hr. weekly for 10 wk. Thursdays	50
P 01381	Advanced Psychiatric Case Seminar [3, 16]	University of California School of Medicine Los Angeles	S	S	16	Small group discussion Lecture or panel	3/ 6/56	I; 2 hr. weekly for 8 wk. Tuesdays	60
P 05011	Psychiatric Problems in Medical Practice	North Shore Health Resort 225 Sheridan Rd. Winnetka, Ill.	S	B	18	Lecture or panel	10/ 5/55	I; 2 hr. monthly for 9 mo. Wednesday evenings	Nil
P 05026	Short Course in Psychiatry [1]	Selected center in Nova Scotia	R	G	Unknown	Unknown	1/30/56	C; 3 days	Unknown
			RADIOLOGY						
P 02934	Radioisotopes [3, 17]	Selected center in San Diego, Calif.	R	G	6	Lecture or panel	10/26/55	C; 1 day	17.50
			SURGERY						
P 02937	Surgery of the Hand [3, 17]	Selected center in San Diego, Calif.	R	G	6	Lecture or panel	11/ 2/55	C; 6 hr.	17.50
P 01378	Plastic Repair of Superficial Wounds [3, 17, 18]	Selected center in San Diego, Calif.	R	G	4	Lecture or panel	11/ 9/55	C; ½ day	17.50
P 02368	Burns [3, 17, 18]	Selected center in San Diego, Calif.	R	G	4	Lecture or panel	11/ 9/55	C; ½ day	17.50
P 04551	Removal of Foreign Bodies from Lung and Bronchi [3, 15]	University of California School of Medicine Los Angeles	S	S	10	Laboratory work Operative surgery	1/13/56	C; 1½ days	80
P 04553	Surgery of Trauma [3, 14]	University of California School of Medicine Los Angeles	R	G	15	Operative surgery Small group discussion	1/16/56	C; 2½ days	75
P 04552	Recent Advances in General Surgery [3]	University of California School of Medicine Los Angeles	R	G	24	Lecture or panel	3/ 7/56	I; 2 hr. weekly for 12 wk. Wednesdays	50
P 04547	Surgery of the Temporal Bone [19]	University of California School of Medicine Los Angeles	S	S	16½	Operative surgery Small group discussion	3/29/56	I; 3½ hr. for 3 days Thursday, Friday, and Saturday	100
P 03725	Minor Surgery in General Practice [3, 21, 22]	University of Cincinnati College of Medicine Eden and Bethesda Aves. Cincinnati 19	R	G	5	Lecture or panel	3/ 4/56	C; 5 hr.	10
P 04415	Week in Surgery [1, 2, 3]	Victoria General Hospital Halifax, Nova Scotia Camp Hill Hospital Halifax, Nova Scotia Children's Hospital Halifax, Nova Scotia	R	G	35	Clinical case work Lecture or panel	4/23/56	C; 5 days	25
			OTHER						
P 04548	Photomicrography [3, 16]	University of California School of Medicine Los Angeles	R	G	12	Laboratory work Lecture or panel	2/15/56	I; 2 hr. weekly for 6 wk. Wednesdays	30

REFERENCES

Address for Inquiries

1. Dalhousie University Faculty of Medicine, Morris St., Halifax, Nova Scotia.
2. American Cancer Society, Kansas Division, 824 Tyler St., Topeka, Kan.
11. The American College of Physicians, 4200 Pine St., Philadelphia 4.
17. University of California School of Medicine, Los Angeles.
21. G. B. Hannah, M.D., Secretary, Education Committee, Southwestern Ohio Society of General Physicians, Sharon and Willow Aves., Glendale, Ohio.
24. Dr. Peter N. Pastore, Box 25, M.C.V. Station, 1200 E. Broad St., Richmond 19, Va.
27. Illinois Academy of General Practice, 14 E. Jackson Blvd., Chicago 4.

Enrollment

	Minimum	Maximum
2.	3	24
6.	3	6
7.	6	35
10.	275	..
12.	50	100
14.	..	25
15.	..	12
16.	..	20
19.	..	10
20.	..	30
23.	22	22
25.	75	100
28.	30	..

Co-Sponsors

9. Kansas Medical Society, Topeka, Kan., and Sedgwick County Medical Society, Wichita, Kan.

Miscellaneous

3. Certificate given.
4. Neurology, Rheumatology, and Physical Medicine and Rehabilitation featured.
5. Of the 31 hours, 14½ are Pediatrics.
13. Fee for members $30; nonmembers $60.
18. Combined session—P-01378 (Plastic Repair of Superficial Wounds) held in afternoon; P-02368 (Burns) held in morning. Fee for entire day $17.50.
22. $10 for one seminar; $25 for four seminars (members).
26. Four day course, two days Ophthalmology and two days Otolaryngology; fee $20 for half, $35 for all.

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Second, that its educational function is of primary and paramount importance and that its service function is secondary and incidental.

Third, that its educational function should be recognized as possessing a character of its own and should not be regarded as an additional year of medical school nor as the first year of a narrowly specialized professional career.

Fourth, the internship should be so organized and administered that it emphasizes the beginning and the progressive increase of the assumption of personal responsibility for the care of the sick, the recognition and cultivation of the personal aspects of the treatment of patients, including family, social, financial, and morale factors, and the learning and acceptance from firsthand experience of the Principles of Medical Ethics and the code of professional conduct.

Fifth, that the service function of the intern, valuable as it is to the hospital, its staff, and its patients, should not be permitted to subordinate the educational purpose of the internship.

Sixth, that hospitals unable or unwilling for any reason to conduct internships meeting the educational standards of the Council on Medical Education and Hospitals in the spirit of the foregoing statements should not be encouraged to establish internships and such internships should not be approved. These hospitals should seek to meet their service needs by establishing house officer positions with adequate salary provisions.

Seventh, that all hospitals university connected and nonuniversity affiliated should be subject to these guiding principles.

The internship promises to continue to challenge medical educators, hospital administrators, and attending professional staff members in the years ahead. There is a widespread impression that the first year of hospital experience following graduation from medical school should be a well-planned rotating or mixed type of program rather than in any single field. There are those, however, who feel that a so-called straight internship if properly organized is satisfactory for the individual who clearly has decided his future area of interest. The value of any internship program will depend largely upon the basic planning underlying it, the continuity of integrated experience it affords, and the supervision it receives from responsible leadership. All medical schools have a "stake" in the internship and in its future as part of medical education.

GRADUATE EDUCATION TOWARD HIGHER DEGREES

Table 10, which portrays the over-all teaching responsibilities of medical schools in addition to the education of undergraduate medical students, indicates that many of the institutions are actively engaged in teaching and supervising graduate students specializing in various basic medical sciences and clinical areas. This is a highly important facet of medical school activity, for it is the students who elect to enter such work who largely constitute the reservoir of future teachers and investigators. Twenty-three medical schools in the United States report 772 physicians seeking M.S. degrees in 1954-1955, and 7 Canadian schools report 17 for the same period. Sixteen schools in the United States enrolled 182 physicians conducting graduate work toward the Ph.D. degree, and three Canadian institutions reported 10 such graduate physicians. Sixty-six schools in the United States reported 1,024, and seven Canadian institutions reported 38 graduate students other than physicians working toward master's degrees in basic medical sciences. Fifty-six schools in the United States reported 983, and nine in Canada reported 57 graduate students other than physicians enrolled in programs leading to Ph.D. degrees in the basic medical sciences.

GRADUATE TRAINING PROGRAMS DESIGNED FOR PROSPECTIVE GENERAL PRACTITIONERS

The medical school questionnaire this year included an inquiry in regard to the sponsorship of programs designed specifically for prospective general practitioners. Five institutions replied that internships were designed for this purpose, and eight indicated that they had aided in developing residency programs in general practice. The internships varied from one to two years in length and residencies from one to three years. Ten schools indicated that they were conducting courses, conferences, or clinics specifically designed for general practitioners. These programs were in addition to undergraduate preceptorships designed to offer medical students an opportunity to have a firsthand contact with the field of general or family practice.

TABLE 25.—*Number of Internships by Medical School Affiliation and Bed Capacity, 1954-1955*

Classification	No. of Approved Hospitals	No. of Internships		
		Filled Sept. 1, 1954	Vacant Sept. 1, 1954	Percentage Filled
Nonaffiliated				
Less than 200 beds	169	707	209	77
200-299	249	1,548	489	76
300-499	168	1,717	389	81
500-over	51	993	130	89
Totals	637	4,965	1,217	80
Major teaching				
Less than 200 beds	11	97	14	87
200-299	19	174	37	82
300-499	46	776	156	83
500-over	64	2,364	399	86
Totals	140	3,411	606	85
Minor teaching				
Less than 200 beds	18	71	38	65
200-299	21	123	56	68
300-499	26	303	48	86
500-over	8	193	17	92
Totals	73	690	159	81
Grand totals	850	9,066	1,982	82

Medical schools and hospitals have demonstrated magnificent leadership in developing excellent programs in graduate education for the specialty areas in recent years. On Sept. 1, 1954, there were 155 hospitals conducting approved graduate training programs in general practice. There were 404 assistant residents or residents participating in these programs. Many individuals among the medical profession, medical educators, and the general public believe that a very real challenge confronts medical education in this field. It is believed by many that there is need for a modern definition of what should constitute general or family practice as it confronts the

young physician of today. If this can be accomplished there is need for cooperative planning on the part of medical schools, hospitals, and professional organizations in the formulation and implementation of graduate programs designed to furnish the background essential for the physician planning to enter this field. The broad challenges and needs for preparation in the field of general or family practice have, in the opinion of many thoughtful individuals, been allowed to go by default as those in the narrower specialty areas have received greater attention.

TABLE 26.—*Postgraduate Courses Offered and Attendance, 1945-1955*

	Short Courses of Less Than Five Days' Duration		Long Courses of Five or More Days' Duration		Miscellaneous Clinical Conferences, Graduate Assemblies, Study and Circuit Courses, and Seminars		Total Courses and Attendance	
Yr.	Total Courses	Attendance	Total Courses	Attendance	Total Courses	Attendance	Total Courses	Attendance
1945-1946	154	4,140	1,070	19,991	52	21,824	1,276	45,955
1946-1947	239	16,274	1,291	23,062	21	20,475	1,551	59,811
1947-1948	496	31,569	1,279	24,878	25	26,356	1,800	82,803
1948-1949	304	16,821	1,074	28,507	67	38,058	1,445	83,386
1949-1950	161	10,523	1,080	24,087	129	40,708	1,370	75,318
1950-1951	420	7,438	1,067	14,890	79	23,855	1,566	46,183
1951-1952	206	7,454	1,543	17,511	120	40,970	1,869	65,935
1952-1953	324	9,452	805	23,793	253	31,363	1,382	64,608
1953-1954	343	14,212	1,185	16,908	156	45,897	1,684	77,017
1954-1955	260	35,398	1,162	21,621	297	48,447	1,719	105,466
Totals	2,907	153,281	11,556	215,248	1,199	337,953	15,662	706,482

POSTGRADUATE MEDICAL EDUCATION

As has been pointed out in the recently completed Survey of Postgraduate Medical Education,[12] which was conducted by the American Medical Association under the auspices of the Council on Medical Education and Hospitals, postgraduate medical education has come to be looked upon as one of the three basic phases of medical education. However, the formalization of postgraduate education has proceeded slowly and somewhat haphazardly during the period when the undergraduate and graduate phases were making rapid strides. The survey clearly indicated that physicians have already recognized the importance of formal postgraduate study, as is evidenced by the fact that they prefer it above all other methods, except the reading of literature, for continuing education.

Approximately 70 undergraduate medical schools in the United States offered or participated in postgraduate medical courses during 1952-1953. The survey reports that they offered nearly 50,000 hours of postgraduate instruction, or about one-third of the nation's total. Physicians responding to the survey questionnaire ranked postgraduate courses offered by medical schools as highest in quality. An overwhelming majority of individuals interviewed during the course of the survey both inside and outside of medical schools expressed the belief that postgraduate medical education is a basic responsibility of the medical schools.

Increasing interest in and need for postgraduate medical educational opportunities will almost inevitably lead to continued greater responsibility for, and participation in, such activities on the part of the medical schools. Their leadership in cooperation with medical societies, hospitals, and the various agencies interested in postgraduate medical education is essential to the future orderly progress of continuing education in this field. Budget, faculty, and facilities for such activities present additional problems to medical administrators that can be evaluated only after careful analysis as to the area needs and type of postgraduate activities in which any given institution should engage. It would seem that the entire area of postgraduate medical education offers outstanding opportunities for regional and institutional cooperation, if maximum potentialities are to be achieved. Currently, in the absence of any effective regional or interinstitutional planning, much needless duplication of effort continues to take place.

The survey concludes that if duplication of effort is to be avoided there is need for the many and varied groups and organizations engaged in postgraduate medical education in any given area to combine their resources in a coordinated program. Neither physicians nor instructors respect state boundaries in their participation in postgraduate medical education and regional coordination would seem a logical approach.

Table 26 summarizes the listed offerings of postgraduate courses and their attendance over the 10 year period from 1945 to 1955. Courses have been divided into short (less than five days' duration), long (five days or more in duration), and miscellaneous (conferences, assemblies, study, circuit courses, and seminars). It is of more than passing interest to note that the drop in course offerings and in attendance in 1950-1951 was not sustained, and that 1954-1955 witnessed the largest recorded attendance to date (105,466), although total course offerings were fewer than in 1947-1948 or in 1951-1952. It should be clearly indicated that there is no way in which the exact total number of physicians in attendance at postgraduate courses can be determined. The total number of registrants includes many individuals who have attended two or more courses during the year. The increasing total registration, however, is indicative of the interest in this area of continuing education on the part of the medical profession.

Forty-nine of the medical schools in the United States and six of those in Canada conducted postgraduate courses during 1954-1955. They reported a total registration of 21,131 physicians enrolled for such courses.

12. Vollan, D. D.: Postgraduate Medical Education in the United States, Chicago, American Medical Association, 1955.

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Foreign Medical Schools and Students

FOREIGN STUDENTS STUDYING MEDICINE IN THE UNITED STATES

In 1954-1955, there were 379 foreign citizens (excluding Canadians) enrolled as undergraduate students in United States medical schools. All but 23 of the 81 approved schools had such students registered, with 104 in the entering class, 110 in the second year, 89 in the third year, and 76 in the fourth year. This represents a slight increase over last year in the number in the entering class and in total enrollment.

Our medical educational facilities make their greatest contribution to foreign students at the intern and residency level. The Institute of International Education, with some assistance from this Council, has recently completed a study of foreign physicians receiving training in United States hospitals. This study is one of three reported in a bulletin of the institute entitled "Open Doors." The results of this survey are also the subject of a recent publication by McCormack and Feraru.[13]

On the basis of returns from 90% of all hospitals approved for graduate training, it was found that there are currently slightly over 5,000 alien physicians serving in our hospitals as interns (approximately one-third) or residents (approximately two-thirds). This survey included only foreign physicians who were in this country for further study with commitments to return to their home countries at the completion of study.

Approximately one-quarter of these alien physicians come from the far eastern countries, one-quarter from Europe, one-quarter from Latin America, and the remaining quarter from other sections of the world.

This group of physicians is participating in intern and residency programs in 42 states, the District of Columbia, Puerto Rico, Hawaii, and the Canal Zone. It is interesting to note that almost 25% have positions in hospitals in New York State.

AMERICAN STUDENTS STUDYING MEDICINE IN OTHER COUNTRIES (EXCLUDING CANADA)

For a variety of causes it is not possible to obtain accurate information in regard to the number of American citizens studying medicine in other countries. Inquiries and other correspondence addressed to this Council suggest that there has been no significant decrease in the recent incidence of Americans seeking their education in medicine outside the United States. Since this appears to be a post-World War II phenomenon, the first of these students should now begin to appear for licensure examination.

Included in the information sent by the state licensing boards to this office is the place of birth and medical school attended of all candidates examined. These records were studied for the period 1950-1954 inclusive for new licentiates who were born in the United States and graduated from medical schools outside the United States and Canada. It is unfortunate that records from New York and Pennsylvania did not include this information, so that the data given below is for all states, territories, and possessions except New York and Pennsylvania. It is hoped that in the future similar data can be made complete by the addition of information from these two states.

During the five year period studied, 99 initial licenses were granted by 18 states, the District of Columbia, Puerto Rico, and the Canal Zone to physicians born in the United States who were graduates of medical schools outside the United States or Canada. Four states, California, New Jersey, Ohio, and Connecticut, granted 64% of all such licenses.

Physicians in this group graduated from medical schools located in 20 different countries, but almost half were graduates of medical schools in Italy or Switzerland. Initial licenses were granted to 15 such physicians in 1950, 10 in 1951, 15 in 1952, 22 in 1953 and 37 in 1954. These figures are in keeping with the belief that we are now just beginning to note the impact of American citizens who studied medicine abroad.

It should be emphasized again that the data given above depicts initial licenses granted to individuals born in the United States who graduated from medical schools outside the United States and Canada. Information on initial licenses granted to such individuals by the states of New York and Pennsylvania is not included.

FOREIGN MEDICAL SCHOOLS

In February, 1950, the Council on Medical Education and Hospitals of the American Medical Association and the Executive Council of the Association of American Medical Colleges first published a list of foreign medical schools whose graduates they recommended for consideration on the same basis as graduates of approved medical schools in the United States. This recommendation is intended only for those students who successfully complete a course of study identical in all respects with that necessary to be eligible for licensure in the country in which the school is located. This list is intended as a guide for institutions and organizations in this country that deal with foreign medical graduates and as an aid to students who plan to study medicine abroad. It appears in this report as table 27.

It is to be emphasized that it is not now and never has been the policy of the organizations sponsoring this list to consider that action listing a foreign medical school is equivalent to granting approval to medical schools in the United States and Canada. Neither is it intended that there be any inference of disapproval of those foreign medical schools not listed. The list is intended only as a guide to state licensing boards, hospitals, and similar groups with the clear understanding of the Council on Medical Education and Hospitals and the Executive Council of the Association of American Medical Colleges that the ultimate responsibility for evaluating medical credentials and qualifications of foreign-trained physicians, whether graduates of listed or nonlisted schools, rests with those other organizations and not with the sponsors of the list.

Somewhat more than a year ago, a cooperating committee on evaluation of graduates of foreign medical schools was formed with participating representatives from the Council on Medical Education and Hospitals,

13. McCormack, J. E., and Feraru, A.: Alien Interns and Residents in the United States, J. A. M. A. **158**: 1357-1360 (Aug. 13) 1955.

TABLE 27.—*Foreign Medical Schools*

List Prepared by the Council on Medical Education and Hospitals of the American Medical Association and the Executive Council of the Association of American Medical Colleges

On the basis of information presently available, the Council on Medical Education and Hospitals of the American Medical Association and the Executive Council of the Association of American Medical Colleges are of the opinion that medical institutions and medical organizations in the United States would be justified in considering current and past graduates of the following foreign medical schools on the same basis that they consider graduates of approved medical schools in the United States. This recommendation is intended only for those students who successfully complete a course of study identical in all respects with that necessary to be eligible for licensure in the country in which the school is located. *Because this list is acknowledged to be a tentative one, the position of the councils with respect to schools not named in the list is that they neither approve nor disapprove them.*

Belgium

Free University of Brussels Faculty of Medicine
(Université Libre de Bruxelles Faculté de Médecine)
Catholic University of Louvain Faculty of Medicine
(Université Catholique de Louvain Faculté de Médecine, or
Katholieke Universiteit te Leuven)
University of Ghent Faculty of Medicine
(Universiteit to Gent Faculteit der Geneeskunde, or
Université de Gand Faculté de Médecine)
University of Liège Faculty of Medicine
(Université de Liège Faculté de Médecine)

Brazil

University of São Paulo Faculty of Medicine
(Universidade de São Paulo Faculdade de Medicina)

China

Peiping Union Medical College

This recommendation applies to all those graduates who were granted the degree of Doctor of Medicine from the date when the first degrees were conferred in 1924 until and including the class of 1943. The education of students in the last class, that of 1943, was interrupted by World War II; therefore, some students finally completed their studies as late as 1949. However, their diplomas were issued as of the class of 1943. Following the communist conquest of China, the name of this school was changed to the China Union Medical College. The recommendation does not apply to this school.

Denmark

University of Copenhagen Faculty of Medicine
(Kobenhavns Universitet Laegevidenskabelige Fakultet)

Finland

University of Helsinki Faculty of Medicine
(Helsingfors Universitet Medicinska Fakulteten)
Medical Faculty Turku University
(Turun Yliopiston Laaketieteellinen Tiedekunta)

Lebanon

American University of Beirut School of Medicine

Netherlands

University of Amsterdam Faculty of Medicine
(Universiteit van Amsterdam Geneeskunde Faculteit)
State University of Groningen Faculty of Medicine
(Rijks-Universiteit te Groningen Geneeskunde Faculteit)
State University of Leiden Faculty of Medicine
(Rijks-Universiteit te Leiden Faculteit der Geneeskunde)
State University of Utrecht Faculty of Medicine
(Rijks-Universiteit te Utrecht Faculteit der Geneeskunde)

The Doctoral Examen that is given at the end of the theoretical part of the study of medicine does not confer the degree of Doctor nor the right to practice medicine. The Arts Examen that is given following the completion of an additional two years of practical work in hospitals confers the title of Doctor and also the right to practice medicine.

Norway

University of Oslo Faculty of Medicine
(Kongelige Frederiks Universitet Medisinske Fakultet)

Sweden

Royal Charles University Medical Faculty, Lund
(Kungl. Karolinska Universitetet Medicinska Fakulteten)
Charles Medico-Surgical Institute, Stockholm
(Karolinska Mediko-Kirurgiska Institutet)
Royal University of Uppsala Medical Faculty
(Kungl. Universitetet i Uppsala Medicinska Fakulteten)

Switzerland

University of Basel Faculty of Medicine
(Universität Basel Medizinische Fakultät)
University of Bern Faculty of Medicine
(Universität Bern Medizinische Fakultät)
University of Geneva Faculty of Medicine
(Université de Genève Faculté de Médecine)
University of Lausanne Faculty of Medicine
(Université de Lausanne Faculté de Médecine)
University of Zurich Faculty of Medicine
(Universität Zurich Medizinische Fakultät)

The recommendation with respect to the following medical schools in Switzerland applies only to those graduates of Swiss medical schools who hold the Swiss-Federal Diploma issued by the Federal Department of the Interior (Eidgenoissisches Department Des Innern, Département Féderal de L'Intérieur) and obtainable only by Swiss citizens who hold the Certificate of Medical Studies (Akademische Zeugnis, Certificat d'Études Médicales) or who hold one of the following certificates which the Swiss Universities issue to those, not citizens of Switzerland, who complete a course of study and pass examinations equivalent to those taken by Swiss citizens in qualifying for the Swiss Federal Diploma:

University of Basel—Academic Certificate on passing the medical examination for physicians (Akademische Zeugnis über die bestandene Fachprufung für Ärzte).

University of Bern—Medical diploma on passing examination for medicine (Aerztliches Fakultats diplom über die bestandene Fachprufung für Ärzte).

University of Geneva and University of Lausanne—Certificate of Medical Studies (Certificat d'Études Médicales).

University of Zurich—Medical diploma for Foreigners (Medizinisches Diplom für Ausländer).

United Kingdom

England

University of Birmingham Faculty of Medicine
University of Bristol Faculty of Medicine
University of Cambridge Faculty of Medicine
University of Durham Medical School, Newcastle-upon-Tyne
University of Leeds Faculty of Medicine
University of Liverpool Faculty of Medicine
University of London*
University of Manchester Faculty of Medicine
University of Oxford Faculty of Medicine
University of Sheffield Faculty of Medicine

Northern Ireland

Queen's University of Belfast Faculty of Medicine

Scotland

University of Aberdeen Faculty of Medicine
University of Edinburgh Faculty of Medicine
University of Glasgow Faculty of Medicine
University of St. Andrews Medical School, St. Andrews and Dundee

Wales

Welch National School of Medicine, University of Wales, Cardiff

The recommendation applies only to those physicians trained in the United Kingdom who hold medical degrees from the universities listed. The recommendation does not apply to those physicians who received their medical training at these universities or their affiliated hospital medical schools but who obtained their qualifications through the examinations of the licensing corporations of the United Kingdom. It must be observed, however, that registration in the United Kingdom is granted equally to physicians holding the diplomas of the licensing corporations and to physicians holding university medical degrees.

* Work for the medical degree of the University of London is offered at the following hospital medical schools:

Charing Cross Hospital Medical School	Middlesex Hospital Medical School	St. Mary's Hospital Medical School
Guy's Hospital Medical School	Royal Free Hospital School of Medicine	St. Thomas' Hospital Medical School
King's College Hospital Medical School	St. Bartholomew's Hospital Medical College	University College Hospital Medical School
London Hospital Medical School	St. George's Hospital Medical School	Westminster Hospital Medical School

the Federation of State Medical Boards, the Association of American Medical Colleges and the American Hospital Association. This committee has not been able to formulate as yet a final program that would provide an equitable and adequate method of evaluating graduates of foreign medical schools. Certain progress in this direction has been made, however, and it is the hope and belief of the cooperating committee that it will be able to devise a mechanism for satisfactorily measuring the individual physician rather than attempting to measure educational programs in foreign medical schools. It is presumed that with the development and implementation of an effective program for evaluating foreign graduates, there will no longer be a need for the listing of foreign medical schools.

Technical Schools

The present report on the technical schools approved by the Council on Medical Education and Hospitals includes background material and the present status of educational programs for medical technologists, x-ray technicians, physical therapists, occupational therapists, medical record librarians, and medical record technicians. The lists of approved technical schools are not included in the present issue but have been revised and published in a separate supplement that will be distributed to hospitals, medical schools, approved technical schools, secretaries of state medical associations, editors of state medical journals, state boards of medical examiners, national and state hospital associations, state boards of nursing examiners, state health officers, medical departments of the federal government, allied technical associations, and other agencies. Copies are also available to individual physicians and other subscribers to THE JOURNAL and may be obtained from the Council on Medical Education and Hospitals of the American Medical Association. Copies of the essentials of an acceptable school for establishing educational programs in these important paramedical fields, in which shortages are acute, are available from the Council to those interested in initiating new schools.

SCHOOLS FOR MEDICAL TECHNOLOGISTS

Background.—In 1928 the American Society of Clinical Pathologists established its board of registry of medical technologists in an effort to elevate educational standards for medical technologists. Realizing the need for school inspections, the society requested the Council on Medical Education and Hospitals of the American Medical Association to aid in the study of training programs in 1933. Essentials of an acceptable school were formulated by the Council with the cooperation of the society and ratified by the House of Delegates of the American Medical Association in May, 1936. The first list of 96 schools approved by the Council was published in THE JOURNAL on Aug. 29, 1936.

In its continuous effort to assist hospitals in the development of training programs, the Council has received the full cooperation of the American Society of Clinical Pathologists, and the board of schools of medical technology and board of registry of the society. The board of schools was established by the society in 1949 to serve in an advisory capacity to the Council in matters relating to standards and the evaluation of educational programs. Revisions of the standards occurred in 1941, 1943, 1947, 1949, and 1953.

The board of schools assists the Council in the evaluation of new applications and annual reevaluations of approved schools. An inspection program is carried out by regional inspectors appointed by the board of schools. These pathologists survey all new schools and, in addition, periodically revisit approved schools. The recommendations of the board on new applications and existing schools of medical technology are submitted to the Council for its consideration.

Present Status.—There are 595 schools presently approved by the Council on Medical Education and Hospitals, or a percentage increase of almost 4% over the 575 approved as of May 15, 1954. This is a net increase of 20 training programs which represents 46 newly approved schools, 23 that have been discontinued, 1 disapproved school, and 2 affiliating hospitals previously tabulated as separately approved schools. On the basis of 1954 annual reports, student enrollment has risen almost 5% to 2,384, as compared with the 2,275 reported in 1953.

Reflecting the concerted recruitment efforts of the College of American Pathologists, American Society of Clinical Pathologists, and American Society of Medical Technologists, the occupancy rate for 1954 is 51% in the 595 educational programs, which have a total training capacity of 4,613 students. Unfortunately, the number of graduates continues to decline. There were 2,063 graduates in 1952, 1,971 in 1953, and 1,956 in 1954. It should be noted that the expected increases in the number of graduates and the 1955 enrollment expected in existing and newly approved schools are not represented in the above tabulations, whereas the increase in current student capacity is included.

The admission requirement to an approved school of medical technology is two years of college education, including certain required courses, in a college or university accredited by a recognized standardizing association. Slightly over 82%, or 489 training programs, base admission on this minimum requirement; 73 (12%) require three years of preclinical college education; and 33, or 6%, a degree for admission.

Collegiate affiliations are encouraged, since they assist in the development of well-organized training programs suitably integrated with the college curriculum, as well as serving as a continuing source of students. A total of 374 hospital schools (63%) have established college or university affiliations. College credit is granted for training received in the hospital training program in 57%, or 337 schools, and a degree is available upon completion of a combined three years of college education followed by one year of hospital training in 54%, or 322 schools. While the preparatory collegiate education is longer in duration, it is the hospital course that is directly concerned with the training of medical technologists. The hospital, therefore, should assume full responsibility for the required 12 month course.

The minimum duration of the hospital course, as specified in the essentials, is 12 months. There are now

523 schools, or 88%, conforming to this requirement, of which 21 schools offer, in addition to the 12 month course, longer training programs. The remaining 72 schools (12%) offer programs of from 12½ to 36 months in duration. Tuition is required by 163 (27%) of the schools and 213 (36%) pay a stipend to students.

Pennsylvania has 46 schools, Ohio 43, Illinois and Michigan 33 each, New York 32, and Texas 31. Pennsylvania schools report a student capacity of 417 with a student occupancy of 54%; Ohio 366, 37% occupancy; Texas 292, 38% occupancy; Michigan 284, 42% occupancy; New York 220, 55% occupancy; and Illinois 219, with a 53% student occupancy. All states, the District of Columbia, the Canal Zone, Hawaii, and Puerto Rico have approved schools.

Application for approval of a school for the training of medical technologists should be made to the Council on Medical Education and Hospitals of the American Medical Association, 535 N. Dearborn St., Chicago 10. Forms will be supplied for this purpose on request and should be completed by the director of the laboratory requesting this approval. Inquiries regarding the registration of qualified medical technologists should be addressed to the Board of Registry of Medical Technologists, P. O. Box 1209, Muncie, Ind.

SCHOOLS FOR X-RAY TECHNICIANS

Background.—Prior to 1944, the approval of these schools had been carried on as a function of the American Registry of X-Ray Technicians. In 1943, the Council on Medical Education and Hospitals of the American Medical Association undertook the evaluation of educational programs for x-ray technicians at the request of the registry, which is sponsored by the American College of Radiology and the American Society of X-Ray Technicians. With the assistance of the college and the registry, standards were developed and adopted by the House of Delegates of the American Medical Association in June, 1944.

Since that time the Council has been increasingly and ably assisted by the American College of Radiology, the American Registry of X-Ray Technicians, and the American Society of X-Ray Technicians. Schools making application for approval are surveyed by state and regional councilors appointed by the American College of Radiology. Approved schools are also periodically resurveyed by radiologists appointed by the College. All data are reviewed by the advisory committee to the American Society of X-Ray Technicians of the American College of Radiology and recommendations submitted to the Council for consideration.

During the past year, revisions of the 1944 standards have been developed with the advisory groups. These revisions, which incorporate a suggested basic curriculum previously approved by the college, registry, and society, will be submitted to the House of Delegates of the American Medical Association for its consideration in December.

Present Status.—At present there are 422 schools approved by the Council on Medical Education and Hospitals for training x-ray technicians. This represents a net increase of 53 schools, or an increase of 14% over last year; there were 58 newly approved schools, 4 discontinued and 1 disapproved school. There has been a 377% increase in the number of approved schools since the first published list of 112 in 1945. Enrollment has increased 517, or 25%, to a total of 2,613 students during the last year in which total training capacity has risen to 3,184 from 2,583, or an increase of 23%. The number of graduates in 1954 was 1,523, as compared with 1,259 in 1953, which is a 21% increase.

The minimum admission requirement is high school graduation or passing a college entrance examination. A total of 400 schools (95%) admit students directly out of high school, 13 schools (3%) require one year of college, 8 schools (almost 2%) require two years of college, and 1 school accepts only R.N.'s. Of the above 422 schools, 6 will accept an applicant with either an R.N. or one to two years of college, 4 an R.N. or high school graduation, and, as noted, 1 school accepts R. N 's only.

The length of training in 195 schools (46%) is 24 months, 12 months in 158 (38%), 18 months in 38, or 9%, a range of 12 to 24 months in 9 (2%), and a range of 14 months to 4 years in the remaining 22 (5%). Tuition is required by 37% of approved schools, and 57% pay students a stipend. There are collegiate affiliations established with 148 schools (35%). College credit is granted for training satisfactorily completed in the hospital training program in 13%, or 53 schools.

There are 38 approved schools in Illinois, 30 in Pennsylvania, 28 in Ohio, 23 in Texas, 21 in California, 18 each in Michigan, Missouri, and New York, 16 in Wisconsin, and 14 or fewer in all but one of the remaining states, the District of Columbia, and Hawaii. One state does not have a school.

Applications for approval of schools of x-ray technology should be submitted to the Council on Medical Education and Hospitals of the American Medical Association, 535 N. Dearborn St., Chicago 10. Inquiries regarding registration of qualified x-ray technicians should be addressed to the American Registry of X-Ray Technicians, Metropolitan Building, Minneapolis 1.

SCHOOLS FOR PHYSICAL THERAPISTS

Background.—From 1928 to 1936 the approval of educational programs in this field was carried out by the American Physical Therapy Association. On request of that association, the Council developed standards that were adopted by the House of Delegates and were published with the first list of 13 approved schools in 1936. The Council, in cooperation with its advisory groups, the Council on Physical Medicine and Rehabilitation of the American Medical Association and the American Physical Therapy Association, has periodically submitted revised standards to the House of Delegates, which were adopted in 1943 and 1949. As a result of over three years of intensive discussion and study, a current revision of standards for educational programs will be submitted to the House in December for its consideration.

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Applications of new schools are reviewed by the advisory groups, surveys are conducted by the Council staff, and recommendatory action is submitted to the Council for action. More thorough periodic evaluation of approved schools is under study.

Present Status.—There are, at present, 35 schools approved by the Council for training physical therapists. This represents an increase of two new schools, in that three affiliating army hospitals were previously tabulated as separate training programs. The training capacity of the senior class in degree and certificate programs is 941 students, as compared with 898 in 1953 and 842 in 1952. The schools reported 1954 senior class enrollment as 690, or a 73% occupancy. As a result of intensive recruitment, enrollment in the preparatory years of training is also increasing. The number of graduates from the degree and certificate programs for the past five years has steadily risen except for the year 1952. There were 490 in 1950, 591 in 1951, 582 in 1952, 591 in 1953, and 609 graduates in 1954.

Certificate and/or degree recognition in physical therapy is available depending upon the students' preparatory education prior to entering the professional curriculum specified in the essentials of an acceptable school. Most schools have both certificate and degree programs, although some offer only one course.

Certificate programs offered in 30 schools vary in length from 12 months to 34 months. The certificate educational program is 12 months in 20 schools and varies from 14 to 34 months in the remaining 10. Students may qualify for entrance to many of the approved schools in several ways. Three years of college education is required by 16 schools, graduation from a nationally accredited school of nursing of at least three years' duration to include certain prerequisite courses is specified by 16, 12 require four years, 5 specify two years of college prior to admission, and 9 will accept qualified graduates of schools of physical education.

The entrance requirement for 18 degree programs of four years' duration is high school graduation. In the remaining 10 degree programs, which are of shorter duration, entrance requirements are specified as three years of college by 6, two years by 3, and four years of college by 1 of the schools. The tuition in all teaching centers closely parallels college fees. Most courses begin in February or the early fall.

Applications for approval should be made to the Council on Medical Education and Hospitals of the American Medical Association, 535 N. Dearborn St., Chicago 10. Forms will be supplied for this purpose on request. They should be completed by the administrator of the institution requesting this approval. Inquiries regarding registration of qualified therapists should be addressed to the American Registry of Physical Therapists, 30 N. Michigan Ave., Chicago 2.

SCHOOLS FOR OCCUPATIONAL THERAPISTS

Background.—In 1933 the American Occupational Therapy Association requested the House of Delegates of the American Medical Association to undertake a survey of educational programs for occupational therapists. Under instruction from the Board of Trustees, the Council on Medical Education and Hospitals developed standards and surveyed existing schools. The Essentials of an Acceptable School of Occupational Therapy were first published in THE JOURNAL, May 4, 1935. The first list of six approved schools appeared in 1938. In cooperation with the advisory groups in occupational therapy, the Council on Physical Medicine and Rehabilitation of the American Medical Association, and the American Occupational Therapy Association, the essentials were revised in 1938 and 1949. New applications are reviewed by the advisory groups, surveys are conducted by the staff, and recommendatory action is submitted to the Council on Medical Education and Hospitals for action. Increased attention is being given to procedures for more frequent periodic reevaluation of existing educational programs.

Present Status.—There are currently 29 schools approved by the Council for training occupational therapists. This represents a net increase of 2 new schools since the May 15, 1954, list of 31 schools separately tabulated, 4 Army hospitals affiliating with one army school. There will be no students accepted into the Army occupational therapy course for the fiscal year 1956, since the course has been put on a stand-by basis.

There has been an increase in student capacity of 61 in 1954 to a total capacity of 960. The enrollment in the senior class of degree and in certificate and advance standing courses is 568 students as compared with 602 for 1953. It should be noted that the schools reported 493 students, not included in the above enrollment, as engaged in the clinical training phase of courses. For the past five years there has been a continuous increase in the number of graduates as follows: 377 in 1950, 418 in 1951, 441 in 1952, 472 in 1953, and 489 in 1954. This represents a percentage increase of 30% in the past five years.

Both certificate and degree recognition are available in occupational therapy depending upon the type and integration of preparatory training prior to entering the professional curriculum. Certificate programs, generally of 18 to 24 months in length, are offered by 22 schools, of which 20 specify a degree prior to admission and 2 accept qualified applicants with either a degree or an R.N. Educational programs of four to five years' duration that lead to a degree are available in 24 schools that admit students directly from high school. Two schools require two years of college prior to admission to degree courses of slightly over two years' duration. Tuition varies in accord with university fees. The majority of courses begin in February and September.

Application for the approval of a school of occupational therapy should be made to the Council on Medical Education and Hospitals of the American Medical Association, 535 N. Dearborn St., Chicago 10. Forms will be supplied for this purpose on request. They should be completed by the administrator of the institution requesting approval. Inquiries regarding the registration of qualified therapists should be addressed to the American Occupational Therapy Association, 33 W. 42nd St., New York 18.

SCHOOLS FOR MEDICAL RECORD LIBRARIANS

Background.—In 1942 the American Association of Medical Record Librarians requested the American Medical Association to evaluate educational programs in medical record library science. The Council formulated standards that were adopted by the House of Delegates of the American Medical Association in June, 1943. Subsequent revisions in standards were made in 1945 and 1949. The first list of 10 approved schools was published in 1944.

Working in close collaboration with the American Association of Medical Record Librarians, its committee on education and registration, and its recently appointed education director, training programs and new applications are reviewed by the Council, periodic surveys are conducted, and recommendatory action is submitted to the Council for action on new and existing schools.

Present Status.—At the present time there are 25 schools approved by the Council for training medical record librarians. This represents a net increase of one school, including two newly approved schools and one school that has been discontinued since 1953. Eighteen approved schools reported a 1954 enrollment of 115, which is an increase of 9 students over the 106 training in the 18 schools that had students in 1953. The number of graduates has progressively increased during the past three years. Graduates for the past five years were as follows: 83 in 1950, 58 in 1951, 92 in 1952, 99 in 1953, and 114 in 1954, or an increase of 38 per cent in this period. A student capacity of 231 was reported for 1954 as compared with 218 in 1953.

Depending upon the students' previous education, both degree and certificate recognition are available following satisfactory completion of the required training program in medical record library science. Of 18 certificate programs that are one year in duration, 13 require either two years of college education or an R.N. for admission, 1 accepts only students with two years of college training, and 4 require a degree. Six schools offer a four year educational program which leads to a degree and admit students directly out of high school. Three schools have a degree program of 12 months' duration with an admission requirement of three years' preparatory college education. Since two schools offer both degree and certificate courses, there are 18 certificate and 9 degree programs available in the total of 25 approved schools. Fifteen schools maintain college or university affiliations.

The beginning dates for courses are predominately in September, several begin in the winter, and a few in June or July. Tuition ranges from $135 to $600, and one school requires none.

Application for approval should be made to the Council on Medical Education and Hospitals of the American Medical Association, 535 N. Dearborn St., Chicago 10. Inquiries regarding the registration of qualified medical record librarians should be addressed to the American Association of Medical Record Librarians, 510 N. Dearborn St., Chicago 10.

SCHOOLS FOR MEDICAL RECORD TECHNICIANS

Background.—In view of the continuing acute shortage of trained personnel in medical record library science, the American Association of Medical Record Librarians recommended that consideration be given to the establishment of additional training programs for students directly out of high school. In cooperation with the Committee on Education and Registration of the American Association of Medical Record Librarians, the Council developed standards which were approved by the House of Delegates of the American Medical Association in December, 1953. These standards are prepared for the training of the medical record technician who, working under the supervision of a qualified medical record librarian or a medical record committee, performs the technical tasks associated with the maintenance and custody of medical records.

As in the case of schools for medical record librarians, the Council evaluates educational programs and new applications and surveys schools in close collaboration with the American Association of Medical Record Librarians. The training of medical record technicians should be conducted in acceptable general hospitals having a minimum of 4,000 annual admissions. These admissions should include an adequate distribution of patients in the various clinical services commonly found in general hospitals. Candidates for admission to an approved school should be proficient in typing and preferably also in shorthand. They should have completed the requirements for high school graduation or should have passed a college entrance examination for admission to an accredited college or university. The minimum length of training is nine months and should include theoretical instruction in anatomy, medical terminology, and medical records, with additional practical training in admitting and discharge procedures, indexing, preparation of reports, and other activities associated with the medical record department.

Present Status.—There are seven schools approved by the Council for training medical record technicians. These schools report a training capacity for 46 students with an enrollment of 28 in 1954. Qualified high school graduates are accepted for courses of from 9 to 12 months' duration. There were 17 graduates reported in 1954.

Application for approval should be made to the Council on Medical Education and Hospitals of the American Medical Association, 535 N. Dearborn St., Chicago 10. Special forms will be supplied for this purpose, and when the required information has been received, the proposed training program will be reviewed in collaboration with the Committee on Education and Registration of the American Association of Medical Record Librarians. The institutions applying for Council approval will, in all instances, receive full information and every possible assistance in the planning and development of training programs in accordance with present standards. Inquiries regarding the registration of qualified medical record personnel should be addressed to the American Association of Medical Record Librarians, 510 N. Dearborn St., Chicago 10.

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MEDICAL EDUCATION IN THE UNITED STATES AND CANADA, 1954-1955

This issue of THE JOURNAL carries the 55th Annual Report on Medical Education in the United States and Canada prepared by the Council on Medical Education and Hospitals of the American Medical Association. Its objective is to inform the profession and all others interested of the current status, developments, and trends in this important area of education. Administrative officials of medical schools and their parent universities and representatives of other agencies have been most cooperative in the submission of the current data and information essential in the compilation of a report of this nature, and for this assistance the Council is deeply grateful.

Analysis of the statistical data and textual information reveals that 1954-1955 has continued to be a year of steady progress in the field of medical education. The University of California at Los Angeles graduated its first class of physicians in June, 1955. Thus there are now 75 approved four year medical schools and 6 schools of basic medical science in the United States. Canada has 11 approved four year medical schools and one school of basic medical science. In 1956 the University of Miami will graduate its first class. The University of Missouri and the University of Mississippi will initiate the instruction of their first third year classes in 1956 in their process of conversion from a two year basic science to a four year program. Albert Einstein College of Medicine has admitted its first entering class for the 1955-1956 academic session. Current plans envisage the admission of the first students at Seton Hall College of Medicine and the University of Florida for the 1956-1957 academic session.

Total enrollment in medical schools in the United States during the 1954-1955 academic year was 28,583, and 6,977 physicians were graduated. This is an all-time record, both for total enrollment and for physicians graduated. It is anticipated that there will be a slight drop in the number of graduates in 1956 and that thereafter, with the completion of the medical school programs currently under development, there will be a steady augmentation of the number of graduates through 1960. It is not possible to accurately estimate the actual number of potential graduates at that time, as the total may be increased by larger enrollments in existing medical schools in addition to those of the newly developing schools.

The general information tables on approved medical schools in the United States and Canada have been made more comprehensive in this report and have made it possible to eliminate several pages of material formerly devoted to short summary sketches on each institution.

Curriculum studies and readjustments are constantly being conducted by the medical schools in efforts to meet the continuing challenge that is presented by the rapid advances in knowledge and the readjustments of emphasis that such information necessitates. On every hand there is evidence of stimulating educational experimentation in the constant effort to afford the best possible background for the young physician. The Council staff can find no institution in the field of undergraduate medical education in the United States and Canada where there is not tangible evidence of continuing effort to achieve the best possible objectives within the limits of the personnel, facilities, and finances of each institution.

There has been a modest improvement in medical school financing as indicated by the projected budgets for 1955-1956; however, the basic "hard money" sources have increased relatively little, while funds available from grants-in-aid for special teaching projects and research have materially increased. It is of considerable interest to all concerned with and interested in the activities of medical schools that such outside grants-in-aid approximate two-thirds of the sum budgeted for basic medical school activities. It is furthermore of interest to note that, except for the facilities and part of the personnel financed by the basic medical school budgets, approximately 95% of the support of the important research that is now conducted by the medical schools is made possible by and is dependent on such grants. Efforts have been made in this report to highlight the importance of this "medical school—granting agency" partnership that has developed in recent years and that has been largely responsible for the greatly augmented teaching and research activities that the schools have been able to conduct.

During recent years, programs of regional cooperation in the field of higher education, beginning with the development of the Southern Regional Education Board, have demonstrated the potentialities of interstate arrangements. These programs to date have used the facilities of both private and government-supported schools in the effort to improve educational opportunities and at the

same time to reduce the need for duplication of costly professional educational institutions in areas that could finance them only under great difficulty. The Western Interstate Compact for Higher Education is now under way, and the basis for a New England regional program has been established. It is to be hoped that the further development of interstate cooperation of this type will continue to give full consideration to the role of both private and government-supported institutions, as it appears to be an exceedingly logical and workable means of approach to meeting needs for opportunities in higher education as well as allowing fair distribution of its cost factors.

This report includes the basic table of a study that has been conducted by the Bureau of Economic Research of the American Medical Association in regard to what happens to medical school graduates. In the relatively near future, the Bureau will issue a report to the medical schools that will give each institution a comprehensive picture of the activities of its graduates and their distribution. It will afford comparative study of the areas of activity into which the graduates of each of the schools have entered. The initial study will represent data for the schools through April, 1950, and it is planned that supplementary data will be furnished in the course of the next two years.

Along with the many evidences of continued progress, the field of medical education faces many challenging problems. Improved financing for more adequate and modernized facilities in some institutions and for faculty remuneration continues to be an important problem. This area of challenge includes clarification of the financing of clinical faculty personnel, questions concerning the institutional practice of medicine, and relationship between medical school faculties and physicians in private practice in areas where schools are located. Faculty recruitment constantly presents challenging problems. Student recruitment is of equal concern. It is to be hoped that the downward trend in number of applicants for admission to the study of medicine has reached its limit and that there will be an increase in qualified applicants in the future. Curriculum readjustments will be a continuing challenge in efforts to meet the constantly changing needs. Each medical school faces the eternal need of maintaining a proper and reasonable balance between its activities in teaching and research. There is no common equation that is applicable in the determination of what this balance should be, and each institution must satisfy its requirements in light of the facilities, faculty personnel, objectives, and resources available to it. Finally, the increasing responsibilities of medical schools in graduate and postgraduate medical education necessitate constant evaluation and reorientation of over-all administrative and teaching and research activities as well as readjustments of facilities, personnel, and financing.

PARTNERSHIP IN MEDICAL TEACHING AND RESEARCH

In the information in this issue of THE JOURNAL in regard to the projected financing of medical education and research during 1955-1956 it will be observed that grants for research and teaching from outside sources will make funds available for these activities equivalent to about two-thirds of the amount projected for basic operational budgets derived from government appropriations, endowment, tuition, general university appropriations, and gifts. Although the medical schools do finance from their basic budgets some of the facilities, equipment, general administrative, and some of the personnel factors involved in these special activities, only 23 of the 81 medical schools in the United States report a total of slightly over $1,500,000 allocated to research from their basic operational budgets. In other words, nearly 40 times as much support for research and special teaching projects is anticipated from outside sources as is to be derived from basic operational budget allocations.

For many years it has been recognized by medical educators that education and research are full partners in the modern setting of a dynamic medical school. New knowledge is accumulating with almost unbelievable rapidity. New problems as well as many older still unsolved ones constantly confront those who teach and practice medicine. The concept of a progressive medical educational institution can no longer be built around the motif of teaching alone, for the staff and curriculum of such an institution would be obsolete almost from the beginning. Good teachers in medicine are persons who are not content with passing on known information and guidance as to its use. They are individuals who are concerned with and stimulated by the constant challenges to solve some of these problems. It is this interest in the solution of problems that, in addition to ability and background preparation, constitutes the backbone of the research instinct. One of the greatest attractions in the field of academic medicine is the opportunity to work in the field of investigation along with the activities involved in teaching students. The end-products of acquisitions to knowledge are not the only inherent values of the research conducted in the medical school environment. One of the important by-products of an environment in which both active teaching and research are taking place is the opportunity offered to medical students to become fully aware of and eventually possessed with the research attitude in its application to all aspects of the practice of medicine.

The present-day development of research in association with teaching presents many problems to medical administrators and teachers. The primary function of medical schools as educational institutions must constantly be maintained in the forefront. Research activities should supplement and enhance the teaching in an institution and never be permitted to overshadow or interfere with the basic needs for sound medical education. The appropriate balance of activities in the two areas is difficult to determine and is a local challenge for each institution to solve in the best interests of both teaching and research.

The support of the activities in teaching and research has in recent years become a partnership between institutions that maintain the basic educational programs and the outside agencies that allocate funds for research and special teaching programs. The importance of this partnership in the maintenance of this dual responsibility should be given full recognition. Many foundations and other organizations have played important roles over the years in underwriting the financing of important experimental educational programs as well as research activities. Among them are such organizations as the Rockefeller Foundation, the Commonwealth Fund, the Carnegie Corporation, John and Mary R. Markle Foundation, the W. K. Kellogg Foundation, the Kresge Foundation, the M. D. Anderson Foundation, the National Foundation for Infantile Paralysis, the American Cancer Society, the American Heart Association, and many other organizations in the fields of mental health, arthritis, crippled children, and various categories of the exceptional child. Pharmaceutical organizations and drug manufacturers have been important contributors to both research and continuing education programs. The Public Health Service and its National Institutes of Health as well as other federal agencies have in recent years constituted the group of organizations allocating the greatest support to research and to the development of special teaching projects.

In any evaluation of the support of the activities conducted in the environment of the medical schools today it is important that full recognition be given to all of the factors that play such important roles in the education of physicians and in the advance of medical knowledge. Without the interest and financial assistance afforded by these many organizations and agencies the dual activities of teaching and research could not have attained their present high development.

BACKGROUND FOR GENERAL OR FAMILY PRACTICE AND SPECIALIZATION

Occasionally the impression is gained that there are some who believe that the basic education and training offered to medical students and young physicians who contemplate entering the field of general or family practice should be something different, less thorough and less exacting than is needed by those who plan to specialize. The discarding of any such outmoded and erroneous concept of a double standard of excellence in basic medical education and training or in medical care is long overdue. The medical profession itself is dedicated to the concept of the best possible medical care for the American public. This necessitates adherence to a single standard of excellence in basic undergraduate and graduate education and training for all medical students and physicians regardless of the field of medical practice that they eventually choose to follow. The cultivation and teaching of medicine on a strictly scientific basis accompanied by wise indoctrination in the art of practice is the only sound professional education to offer all persons planning to dedicate their future to any phase of the practice of medicine. To achieve this end there can be no concept of double standards.

Events occurring in the first half of the 20th century have profoundly changed the practice of medicine and the educational background essential in preparation for its pursuit. Knowledge of scientific information applicable to all areas of medical practice has accumulated with almost bewildering rapidity. At the turn of the century a medical diploma was almost an open door to any and all facets of the medical practice of that period. With the currently available knowledge applicable to medicine no single individual can be equally effective in all areas of practice. Specialization has been a natural and necessary accompaniment of this vast accumulation of applicable scientific knowledge. It is a recognized essential part of the practice of medicine today and will be a permanent aspect of the medicine of the future. To be of maximum effectiveness it must be cooperative in nature, for man and his medical problems must be evaluated as a whole and not in isolated segments.

The need for high standards of preparation for the practice of any specialty in medicine has long been recognized. Excellent programs of graduate and postgraduate medical education have been developed by the various specialty boards in their efforts to assure that those whom they certify can render the best possible care to the American public they will serve. On the other hand, the planning and development of genuinely adequate programs of graduate education for those who choose to follow the field of general or family practice has not generally received such meticulous attention on the part of medical educators.

In view of the broad and comprehensive challenge confronting any physician who enters the field of general or family practice today, it would seem that a single year of rotating internship, no matter how carefully planned or supervised, is inadequate graduate preparation. Many of the medical schools have incorporated student externships, family care programs, general practice clinics, and other approaches in an effort to give the undergraduate some concept of the challenge and scope of this field of activity. A few institutions have developed graduate experiences of two years or longer designed to offer better preparation for this area of practice. Currently medical educators face the challenge of careful evaluation of the needs in graduate education for those who choose this field and development of programs that will reflect the same thought and consideration that has been given to graduate medical education in the narrower specialty fields. Trends in specialization will not eradicate, in the foreseeable future, needs for well-qualified and highly competent personnel in the field of general or family practice. Is it not time, therefore, that every effort should be made to assure the same high standards of preparation for "specialists" in this important field as have been given to the preparation of personnel in the narrower specialties? Such developments will involve analysis of the current needs and definition of the scope of general

or family practice today and its potential future in order to design graduate educational programs of maximum value.

CURRICULUM—A RACECOURSE OR A WELL-PLANNED PROGRAM?

Literally translated from the Latin, the word curriculum means "a running" or "a racecourse." In its usually accepted sense, it is interpreted as meaning a course of study or the whole body of courses offered in an educational institution or in one of its departments. Knowledge of science and human behavior applicable to the field of medicine is currently accumulating at such a rapid rate that those responsible for the development of the course of study in a medical school are constantly confronted by the challenge of preventing the curriculum from becoming a racecourse rather than a well-balanced program.

In the foreword to the Proceedings of the First World Conference on Medical Education, Sir Lionel Whitby [1] indicates that "the curriculum, important as it is, is no more—and no less—than the structure of medical education; and this structure is given significance by the spirit that informs it and the functions that are fulfilled within it." Deitrick and Berson [2] in the introduction to the report of the survey "Medical Schools in the United States at Mid-Century" call attention to the fact that "in the educational program of a medical school the quality of the faculty and its attitude towards and interest in education are more important than the exact organization of the curriculum." They furthermore state that "a curriculum can be sound only if it is designed for the student and based on sound educational principles. The curriculum must be designed by the faculty as a whole. Each department must see clearly the complete sphere of the program before considering its own segment, and with the student the paramount interest in mind."

Traditional patterns developed in curriculum planning are difficult to readjust unless those who are charged with the responsibility of the curriculum's organization are fully aware of the areas requiring modification in light of the constantly changing scene. No one person in a medical school setting can effectively accomplish it. No small group within a medical school can keep a curriculum dynamic and reasonably balanced unless it effectively represents all facets of the total curriculum content and has a clear-cut concept of the objectives of the total program. It is difficult to readjust traditional allocations of time that require major modification in courses unless curriculum planners have sound knowledge and perspective. Too frequently there is a tendency to add to the curriculum without the preliminary or associated subtraction that is imperative if the total program is to be meaningful.

Departments sometimes indicate that they cannot reduce time and maintain an effective program. It is doubtful that there is any area in a medical curriculum that cannot be modified to fit into a reorganized program if there is complete understanding and full appreciation of the need for such readjustment. Information of details, sometimes forgotten as soon as courses are passed, can be effectively replaced by programs designed to give sound concepts that, in the long run, may represent a more permanent acquisition of knowledge. Curriculum changes made with resentment, lack of full understanding, or unwillingness to modify course content in keeping with modified time allocations may be unrewarding. Those made with widespread knowledge and acceptance of the objective in the total program and entered into with understanding cooperation can achieve the desired ends. Thus, the effectiveness of the curriculum in a medical school does center on the quality of the faculty and its attitude toward and interest in medical education. Unless each department is aware of the total program and its role in it and fully conscious of the changes that necessitate modifications of time allocations and course content, curriculum planning can indeed result in a racecourse for the student rather than the well-balanced educational opportunity it should be.

MEDICOLEGAL SYMPOSIUMS IN OCTOBER

Lawyers and physicians will be taking a major step toward better understanding in the medicolegal field when they meet together at three regional symposiums in October (see this issue, page 611). The need for closer cooperation becomes more apparent with each additional change in our already complex laws and with the many advances in medical science. The Law Department and the Committee on Medicolegal Problems of the American Medical Association are sponsoring this series of meetings where the two professions may discuss important medicolegal subjects and exchange information.

This is an encouraging move at a time when the physician is becoming increasingly aware of the duties, responsibilities, and privileges involved in his somewhat unusual relationship with the law. Busy with practice and research, the physician may not know of or be able to meet the demand on his time and energy that may be necessary in his medicolegal role. A good working relation between the legal and medical professions is needed not only by the two professions but by the public. Working together and with the courts, the two professions should be able to iron out many of the difficulties that harass the lawyers and physicians, particularly in the fields of criminal investigation, expert testimony, and professional liability.

The success of interprofessional discussions in numerous localities is an indication of the gains that can be anticipated through larger meetings drawing participants from wider areas. The opportunities for good in this field are large. The cooperation of the profession in planning the symposiums and the enthusiasm displayed through advance registration thus far give promise of attaining these potentialities.

1. Whitby, L., in Proceedings of the First World Conference on Medical Education, London, England, Oxford University Press, 1954, p. iii.

2. Deitrick, J. E., and Berson, R. C.: Medical Schools in the United States at Mid-Century, New York, McGraw-Hill Book Company, Inc., 1953, pp. 5-6.

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ORGANIZATION SECTION

FEDERAL MEDICAL LEGISLATION

First Session, 84th Congress

Medical Facilities Survey and Construction Act of 1955

Congressman Davidson (D., N. Y.) proposes, in H. R. 7838, "to amend the hospital survey and construction provisions of the Public Health Service Act to provide assistance to the States for surveying the need for psychiatric hospitals, psychiatric treatment and rehabilitation facilities, and facilities for the diagnosis, treatment, and care of narcotic addicts, and to provide assistance in the construction of such facilities through grants to public and nonprofit agencies, and for other purposes." This amendment would authorize 75 million dollars in matching grants over a three year period for construction and $750,000 to assist the states in making surveys of their existing psychiatric facilities for drug addicts. Assistance could not exceed 50% of costs, but each state's allotment would not be less than $25,000. This bill was referred to the Committee on Interstate and Foreign Commerce.

Federal Scholarships for Scientific Subjects

Congressman Powell (D., N. Y.) has introduced, in H. R. 6176, a similar bill to his H. R. 2179, previously reported. This would authorize the Commissioner of Education to award scholarships for college or graduate study in engineering, physics, chemistry, or similar scientific subjects, which could include medicine. A commission of 12 would advise the Commissioner of Education on administration of this program. Both measures were referred to the Committee on Education and Labor.

MEDICOLEGAL SYMPOSIUMS PLANNED

More than 300 physicians and attorneys are expected to attend each of three medicolegal symposiums planned for Oct. 9, 16, and 30 in Chicago, Omaha, and New York City under the sponsorship of the A. M. A. Law Department and the Committee on Medicolegal Problems. Some of the subjects to be discussed include the physician's role in investigating violent deaths, the increasing number of unjustified professional liability suits, and the responsibility of physicians and lawyers in assuring unbiased medical testimony in personal injury cases.

The meetings are intended to improve the understanding by each profession of the problems of the other and to make the result of medical-legal contact more successful for both professions and the public. C. Joseph Stetler, Director of the Law Department, is directing the series of meetings. Among physicians and attorneys who will participate will be Dr. Elmer Hess, A. M. A. President; Dr. George F. Lull, Secretary-General Manager; James R. Reuling, Trustee; Dr. Louis J. Regan, Los Angeles, physician and attorney; Dr. Alan R. Moritz, Cleveland, Chairman of the Committee on Medicolegal Problems, and Irving Goldstein, Chicago, legal authority.

A feature of the symposiums will be a demonstration illustrating a medical expert witness under direct and cross examination. The witness will be Dr. Ralph E. DeForest, Secretary of the Council on Physical Medicine and Rehabilitation, who will be examined by R. G. Van Buskirk and Edwin J. Holman of the Law Department staff. Conference chairman will be: Chicago—Dr. Harlan English, Danville, Ill.; Omaha—Dr. Joseph D. McCarthy, Omaha; New York—Dr. David B. Allman, Atlantic City, N. J. Other participating physicians will be Eric Oldberg, L. Willard Shabat, and Roland P. Mackay, Chicago; Richard Ford, Boston; John Gilligan, Nebraska City, Neb.; and Samuel Brock, New York City.

The Federal Medical Legislation summary is prepared by the Washington Office of the American Medical Association.

ANNUAL CONFERENCE ON PHYSICIANS AND SCHOOLS

The fifth annual Conference on Physicians and Schools, sponsored by the A. M. A. Bureau of Health Education, will be held Oct. 12-14 at the Hotel Moraine, Highland Park, Ill. These conferences are designed to explore policies for joint action by those in public health, education, and medicine that will lead to the development of effective health services for school children and to explore the influence of today's pattern of living on the health and behavior of children. Much of the program is given to discussion groups. Among the speakers on the program will be Surgeon General Leonard Scheele, U. S. Public Health Service, and Samuel Brownell, commissioner, Office of Education, U. S. Department of Health, Education, and Welfare. Dr. James R. McVay, Kansas City, Mo., member of the A. M. A. Board of Trustees, will preside at the dinner the evening of the first day, and A. M. A. President Elmer Hess will be the principal speaker.

QUARTERLY CUMULATIVE INDEX MEDICUS

Volume 53 of the Quarterly Cumulative Index Medicus, covering literature for the first half of 1953, has been mailed to subscribers and is now available for purchase from the Order Department of the American Medical Association. It is expected that the next volume will be in the final stages of production by the end of the year. Beginning Jan. 1, 1956, the subscription rate for the Index will be increased to $25 per year and the price for a single volume to $15. However, any orders for volumes due in 1953, 1954, and 1955 placed in advance of this date will be honored at the old rates.

MEDICAL NEWS

CALIFORNIA

Workmen's Compensation Lectures.—Lectures on California workmen's compensation will be given at the University of California Extension Center, 813 S. Hill St., Los Angeles, on Mondays, 7-9 p. m., for 15 weeks beginning Oct. 10. Douglass A. Campbell, referee with the California Industrial Accident Commission, will serve as instructor.

Hospital News.—Samuel Merritt Hospital, Oakland, has changed its organization from a trusteeship to a nonprofit corporation. The Merritt Hospital, a 40-bed institution in 1909, has grown to a 7 million dollar, 225-bed medical center under a three man trusteeship, established to carry out the wishes of Dr. Samuel Merritt, a pioneer doctor and former mayor of Oakland. The new seven-man board of directors includes Drs. George G. Reinle, president, and William Earl Mitchell, vice-president (trustees), and Drs. James A. Barr and Philip N. Baxter.

Annual Practitioners Meeting.—The seventh annual scientific assembly of the California Academy of General Practice will convene at the Palace Hotel, San Francisco, Oct. 9-12. Presentations by out-of-state speakers will include:

Teen-Age Gynecology, Goodrich C. Schauffler, Portland, Ore.
Background of Coronary Artery Disease, William H. Gordon, Lubbock, Texas.
Obesity and Thinness; Which Goiters are Best Treated with Radioactive Iodine and Which with Surgery? Edward H. Rynearson, Rochester, Minn.
Migraine and Vascular Headaches, Perry S. MacNeal, Philadelphia.
Present Day Aspects of Cancer of the Intestinal Tract, Edward S. Judd Jr., Rochester, Minn.
The Acute Surgical Abdomen in Infancy and Early Childhood, Charles W. McLaughlin Jr., Omaha.
Cancer of the Uterus: Diagnosis and Treatment, Joe V. Meigs, Boston.

A live clinic on pulmonary disease problems has been scheduled for Tuesday, 1:30 p. m. The dinner dance (informal) will be held at 7:30 p. m. Tuesday.

CONNECTICUT

Yale Society Meeting.—Dr. Charles Gardner Child III, professor of surgery, Tufts College Medical School, Boston, will present before the Yale Medical Society at 8:15 p. m. Oct. 10 in the Fitkin Amphitheater at the Yale-New Haven Medical Center "The Surgical Physiology of Portal Hypertension." All physicians are invited.

DISTRICT OF COLUMBIA

Annual Scientific Assembly.—The Medical Society of the District of Columbia will hold its 25th annual scientific assembly at the Hotel Statler, Washington, D. C., Oct. 10-12. The address of welcome by Dr. W. Ross Morris, president, Monday, 9:15 a. m., will be followed by "The Scientific Basis for Surgical Treatment of Coronary Disease" by Dr. Claude S. Beck, Cleveland; "The Clinical Aspects of Surgery for Coronary Disease" by Dr. Bernard L. Brofman, Cleveland; "Evaluation of the Antipoliomyelitis Program" by Drs. Thomas Francis Jr., Ann Arbor, Mich., and Robert F. Korns, Albany, N. Y.; and "The Veterans Administration Hospital Program" by Dr. William B. Walsh, Washington, D. C. The afternoon session will open with a symposium on diagnostic and therapeutic uses of radioisotopes, with Dr. Oscar B. Hunter Jr., Washington, D. C., as moderator. The symposium will be followed by "Therapy of Far Advanced Carcinoma of the Breast" by Dr. James R. Maxfield Jr., Dallas, Texas, and "Chemotherapy in Malignant Disease" by Dr. C. Lockard Conley, Baltimore. A symposium on the tissue committee from the viewpoint of the surgeon is scheduled for Wednesday at 10:45 a. m., and a clinicopathological conference will be held at 3:15 p. m. Presentations by out-of-state speakers on Tuesday and Wednesday will include:

Obstetrical and Gynecological Applications of the Effect on the Pelvis by Man's Assumption of the Erect Posture, Joshua W. Davies, New York.
Complications of Chlorpromazine Therapy, Jacob Kirshner, New York.
Appraisal of Total Gastrectomy, Karl C. Jonas, Philadelphia.
Newer Aspects of Sympathectomy in Arterial Occlusive Disease, Gerald H. Pratt, New York.
Long-Term Anticoagulants in Coronary Atherosclerosis, E. Sterling Nichol, Miami, Fla.
Problem of the Solitary Pulmonary Nodule, C. Allen Good, Rochester, Minn.
Esophagitis—A Common Condition Frequently Overlooked, Herbert W. Schmidt, Rochester, Minn.
Newer Aspects of Therapy in Infectious Hepatitis, Thomas C. Chalmers, Boston.
Recent Advances in Studies in Infertility, Fred A. Simmons, Boston.
Coagulation Defects in the Postpartum Period, Arthur Sawitsky, Jamaica, N. Y.
Early Stages in Development of Carcinoma of the Cervix, Leland D. Stoddard, Augusta, Ga.
Differential Diagnosis of Hemorrhagic Disease, Kenneth M. Brinkhous, Chapel Hill, N. C.
Secondary Hemolytic Disease in Malignancy and Uremia, Ernest E. Muirhead, Dallas, Texas.
Some New Concepts of Thyroid Dysfunction, Henry H. Turner, Oklahoma City.

ILLINOIS

Psychiatric Lecture.—Dr. Francis J. Gerty, professor and head of the department of psychiatry at the University of Illinois College of Medicine, will present "The Use and Abuse of Sedatives and Stimulants" Nov. 2, 8 p. m., at the North Shore Health Resort, 225 Sheridan Rd., Winnetka.

Chicago

Personal.—Dr. Adolph Rostenberg, professor of dermatology, University of Illinois College of Medicine, will serve as moderator for a panel on cutaneous allergy during a course in occupational skin problems for physicians, which will be presented by the department of preventive medicine and industrial health, University of Cincinnati, Oct. 10-14.

Hektoen Lecture.—The Hektoen Institute for Medical Research of the Cook County Hospital announces that the second Dr. Ludvig Hektoen Memorial Lecture will be delivered by Prof. Herwig Hamperl, director of the Pathological Institute of the University of Bonn, Germany, on nutrition and disease at 8 p. m. Oct. 12 in the amphitheater of the department of pathology of Cook County Hospital, 1825 W. Polk St., Chicago 12.

Lectures on Cancer.—Northwestern University Medical School will present its annual series of cancer lectures for members of the medical profession on Wednesdays, 5-6 p. m., Oct. 12-Nov. 23, in the auditorium of the Veterans Administration Research Hospital, 333 E. Huron St. Dr. William B. Wartman, chairman, department of pathology, Northwestern University Medical School, is coordinator of the lectures. The programs for October are as follows:

Oct. 12, Pathology of Cancer of the Lung Correlated with Diagnosis, Treatment and Prognosis, Lauren V. Ackerman, St. Louis.
Oct. 19, Comparison of Adult, Embryonic, and Cancer Tissues, Harry S. N. Greene, New Haven, Conn.
Oct. 26, Studies on the Mechanism of Hydrocarbon Carcinogenesis, Charles Heidelberger, Ph.D., Madison, Wis.

Fire Prevention Week.—During Fire Prevention Week, Oct. 9-15, 16 hospitals that have received emergency training from the Fire Prevention Bureau will participate in a special program, in cooperation with the Chicago Hospital Council, Greater Chicago Safety Council, the Program Committee, and the Fire Prevention Bureau. Demonstrations will include fire escape drills and fire emergency demonstrations. A demonstration on a fireboat, scheduled for 11 a. m. Thursday, will be followed by an award luncheon and theater party.

Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education, and public health. Programs should be received at least three weeks before the date of meeting.

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Robert A. Black Lecture.—Dr. Lewis Thomas, professor of pathology, New York University School of Medicine, will deliver the third Robert A. Black Lecture, "The Origin and Nature of Fibrinoid," at La Rabida Jackson Park Sanitarium Oct. 14, 12 noon, as part of the staff scientific meeting, which begins at 10 a. m. All physicians are invited.

Orthopaedic Society Meeting.—The Chicago Orthopaedic Society will hold a meeting at the Palmer House Oct. 14 in private dining room 17. The following program will be presented at 8 p. m.:

Studies on the Use of Cultured Calf Bone in Human Bone Grafts—A Complete Presentation of This Subject, Using Motion Pictures and Photomicrographs, E. J. Tucker, Houston, Texas.

The Antigenicity of Homogenous and Homologous Bone Grafts—Results of Histological Study of Bone Grafts and Host Response in Immunologically Prepared Animals and Control Animals, William F. Enneking, Chicago.

Immunology of Bone Transplants—Studies of a Host Rejection to Bone Grafts and Experimental Attempts to Control This Inflammatory Response, Michael Bonfiglio, Iowa City.

Drs. C. Howard Hatcher, Chicago, and Charles F. Gregory, Indianapolis, will discuss the papers. Cocktails, 6 p. m., and dinner will precede the program. All physicians are cordially invited.

Joint Meeting and Heart Clinic.—The Englewood, Jackson Park, South Chicago, South Side, and Stock Yards branches of the Chicago Medical Society and the Chicago Heart Association will hold a joint meeting Oct. 12, 2-6 p. m., at the University of Chicago Clinics, pathology 117 (amphitheater), 950 E. 59th St. (Phone: MIdway 3-0800). A cardiac clinic conducted by faculty members of the University of Chicago School of Medicine will include: "A Case of Rheumatic Heart Disease" (discussion opened by Dr. Albert Dorfman); "A Case of Refractory Congestive Failure" (discussion opened by Dr. Robert G. Page); "A Case of Combined Lung Failure and Heart Failure" (discussion opened by Dr. Robert H. Ebert); and "A Case of Mitral Valvulotomy" (discussion opened by Dr. Richard J. Jones and Dr. William E. Adams). Dr. Wright R. Adams and Dr. George V. LeRoy will preside. All physicians are welcome.

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LOUISIANA

Dedication of the Hutchinson Building.—Dedication of the new 10-story addition to the Hutchinson Memorial Medical Building, which houses the school of medicine at Tulane University, New Orleans, will be held Oct. 13-16. The Thursday dedication exercises will be presided over by Dr. Maxwell E. Lapham, dean of the school of medicine. The principal address will be delivered by Dr. Andrew J. Warren, former director of the division of medicine and public health, Rockefeller Foundation, New York. Other speakers include Dr. Cassius J. Van Slyke, associate director, National Institutes of Health, Bethesda, Md.; Joseph M. Jones, LL.B., president of the Tulane board of administrators; Rufus C. Harris, LL.D., Tulane president; Dr. William W. Frye, dean of the Louisiana State University School of Medicine; and the Rev. Sherwood Strobel Clayton, rector of Grace Episcopal Church. At 2 p. m. a panel on medical education will be held under the chairmanship of Dr. Clifford G. Grulee, New Orleans. Participants will include Dr. Lester J. Evans, New York; Dr. Granville A. Bennett, Chicago; and Dr. John W. Patterson, Cleveland. On Friday scientific sessions will be held on medicine, pathology, psychiatry and neurology, microbiology, and pharmacology. Sunday sessions will feature programs and demonstrations to be staged by faculty members of all departments of the school. Open house and a reception will be held from 3 to 5 p. m., including a tour of the building and inspection of exhibits and demonstrations. The public is cordially invited.

MINNESOTA

Society News.—A joint meeting of range and county medical societies, Oct. 13 at the Androy Hotel in Hibbing, will have as guest speaker Dr. George A. Hellmuth, chief of cardiology, Marquette University School of Medicine, Milwaukee, whose topic will be "Diagnosis and Treatment of Serious Cardiac Arrhythmias."

NEW YORK

County Society Meeting.—The monthly meeting of the Broome County Medical Society will be held Oct. 11, 8:45 p. m., at Binghamton City Hospital, Binghamton. Mr. Richard M. Stalvey, administrative assistant, Bureau of Investigation, American Medical Association, Chicago, will deliver a paper entitled "Beware of Gadgets That Cure."

Society News.—The Medical Society of the County of Erie will be the guests of the Pfizer Laboratories of Brooklyn at a dinner party and lecture in the ballroom of the Hotel Statler in Buffalo Oct. 10. Sir Harold Scott of London, who was head of Scotland Yard for eight years, will discuss "Scotland Yard at Work." The dinner meeting and lecture will be preceded by a cocktail party at 6:30 p. m.

New York City

Personal.—Dr. Philip H. Sechzer was recently appointed assistant professor, department of anesthesiology, New York University Postgraduate Medical School.——Dr. Harry M. Zimmerman, chief, laboratory division, Montefiore Hospital, recently went to Israel to discuss with officials of the two organizations building plans for the new medical school to be incorporated in the $12,500,000 Hadassah-Hebrew University Medical Center. En route, Dr. Zimmerman read a paper on brain tumors before the International Congress of Neuropathology in London, England.——Dr. Leonard H. Schuyler has been appointed an assistant medical director of the American Heart Association, where he will aid in administration of the research support and professional education programs.——Dr. Arthur Alexander Knapp was recently invited to be a guest at the global strategy discussions at the U. S. Naval War College at Newport, R. I.

Annual Academy Fortnight.—The 28th annual Graduate Fortnight of the New York Academy of Medicine will be concerned with "Problems of Aging." The meetings, Oct. 10-21, will be held at the academy, 2 E. 103rd St. The following panel meetings have been scheduled: Aging and Atherosclerosis; Everyday Problems in the Care of the Aged; Management of Cardiovascular Renal Problems in the Aged; Management of Prostatic Obstruction; Public Health Aspects of Aging; and Problems of Infectious Diseases and Their Therapy in the Aged. The afternoons will be devoted to hospital clinics. The opening address will be delivered Oct. 10, 8:30 p. m., by Dr. Edward J. Donovan, president of the academy, after which the Ludwig Kast Lecture, "What Is Aging?" will be delivered by Albert I. Lansing, Ph.D., professor of anatomy, Emory University School of Medicine, Emory University, Ga. The evening session Oct. 11 will open with presentation of "Arthritis in the Elderly Patient" by Dr. Joseph J. Bunim, clinical director, National Institute of Arthritis and Metabolic Diseases, Bethesda, Md. The Wesley M. Carpenter Lecture, "Some Physiological Aspects of Aging," will be delivered Oct. 12, 8:30 p. m., by Nathan W. Shock, Ph.D., chief section on gerontology, National Heart Institute, Bethesda, Md., and of the Baltimore City Hospitals. The evening session Oct. 13 will be devoted to a panel meeting on cerebrovascular disease with aging and the evening session Oct. 14 to a panel meeting on problems of retirement. During the second week the Harlow Brooks Lecture, "The Nature of the Response to Stress with Aging," by Dr. James L. Whittenberger, professor of physiology, Harvard School of Public Health, Boston, will open the Monday evening session. On Thursday evening there will be a panel meeting, "Gonadel Function and Involution in Man—and Related Practical Management" and on Friday evening a panel meeting, "Disorders of the Special Sense Organs Associated with Aging: Their Recognition and Treatment."

UTAH

Health Commissioner Sought.—Dr. James Z. Davis, Salt Lake City, who is serving as chairman of the state board of health, has been appointed to coordinate operations of the state health department in the absence of a health commissioner. A special committee, headed by Dr. Charles Ruggeri Jr., Salt Lake City, is continuing its search for a commissioner to replace Dr. George

A. Spendlove, who resigned to become assistant director of public welfare for the state of Washington. Assisting Dr. Davis is Dr. Joseph P. Kesler, assistant public health director and director of the state children's health center at Fort Douglas, who has been appointed active director of the department.

WEST VIRGINIA

Society News.—The annual meeting of the West Virginia Heart Association will be held in the Hotel McLure in Wheeling Oct. 13. A wet clinic session is scheduled at the Wheeling Hospital nurse's home at 10 a. m. The scientific session at the McLure at 2 p. m. will be followed by the annual business meeting. A social hour at 6 p. m. will precede the annual dinner.

GENERAL

Nominations for Lederle Awards.—The closing date for nominations for Lederle Medical Faculty awards to be made during the academic year 1956-1957 is Oct. 31. Nominations will be received from deans of medical schools or, with their approval, from the heads of preclinical departments of medical schools in the United States and Canada and should be addressed to Office of the Secretary, Committee for Lederle Medical Faculty Awards, Pearl River, N. Y., where information may be obtained. The awards will be announced on or before Jan. 15, 1956.

Meeting on Cerebral Palsy.—The American Academy for Cerebral Palsy will hold its annual meeting at the Claridge Hotel in Memphis, Tenn., Oct. 10-12 under the presidency of Dr. Lenox D. Baker, Durham, N. C. The meetings are open to members of the medical and allied professions. The program will include instructional courses in the various phases of cerebral palsy as well as a formal program. Those wishing to attend may obtain an invitation on request to Dr. Robert A. Knight, Secretary-Treasurer, 869 Madison Ave., Memphis 3, Tenn.

Oak Ridge Traveling Lecture Program.—During the academic year 109 scientists from Oak Ridge, Tenn., will make available their services as lecturers to colleges and universities, particularly to those in the Southern region, as part of the Atomic Energy Commission's program of disseminating information to institutions of higher education. The Oak Ridge scientists will travel on request to university campuses under the Oak Ridge Traveling Lecture Program, a joint activity of the Oak Ridge National Laboratory and the Oak Ridge Institute of Nuclear Studies. The speakers, their topics, touching virtually every field of scientific endeavor, and instructions on request for lecturers are listed in the brochure, which may be obtained by writing: Chairman, University Relations Division, Oak Ridge Institute of Nuclear Studies, P. O. Box 117, Oak Ridge, Tenn.

Fellowships for Women.—The American Association of University Women will offer 28 fellowships to American women for advanced study or research during the academic year 1956-57. In general, the $2,000 fellowships (18 unrestricted; 2 for study outside the United States; 1 for research in chemistry, physics, or biology) are awarded to young women who have completed residence work for the Ph.D. degree or who have already received the degree; the $2,500-$3,500 awards, all unrestricted, are given to more mature scholars. Applications must reach the association's office in Washington, D. C., by Dec. 15, 1955. For information, address the Secretary, Committee on Fellowship Awards, American Association of University Women, 1634 Eye St., N. W., Washington 6, D. C. American women are eligible for a number of international fellowships contributed by the association, which are awarded by the International Federation of University Women. The successful candidate must study outside her own country, but there is no restriction as to subject.

Rhinologic Society Meeting.—The annual meeting of the American Rhinologic Society will be held at the Palmer House, Chicago, on Oct. 8. Dr. Maurice H. Cottle, Chicago, president, will deliver the address of welcome after the reception and breakfast at 8 a. m. During a symposium on septum surgery, Dr. Walter E. Loch, Baltimore, will present "Submucous Resection Operation: Its Status After 50 Years," and "Submucous Reconstruction Operations" will be presented by Dr. Robert M. Hansen, Portland, Ore. ("Metzenbaum Modifications"); Dr. Walter J. Aagesen, Anderson, Ind. ("Eastern Group Approach"); and Dr. Kenneth H. Hinderer, Pittsburgh ("Total and Subtotal Replacements"). Dr. Ralph H. Riggs, Shreveport, La., will serve as moderator for a panel discussion on the symposium topic, with the symposium participants as panelists. Eight presentations will be delivered by members (time permitting), or be read by title only. At 2:15 p. m., after the luncheon, guest presentations will be delivered by Dr. Robert Gronner, Northwestern University, Chicago ("The Rhinologist's Patient"), and Thomas P. Dougherty, Ph.D., University of Utah, Salt Lake City ("Connective Tissue, Inflammation, and Steroids"). Cocktails and a reception in honor of the Drs. Gronner and Dougherty will be held at the conclusion of the program.

Pathologists Meeting in Chicago.—The ninth annual session of the College of American Pathologists will convene at the Drake Hotel, Chicago, Oct. 9, 10, 11, and 15, under the presidency of Dr. David A. Wood, San Francisco. The sessions will open Monday with a panel discussion, "Medical Care Plans and the Pathologist," followed by panel discussion on "The Joint Commission on Accreditation of Hospitals and the Pathologist." Panel discussions in the afternoon session will be "Medical Photography" and "University Departments and the Private Practice of Pathology." A fellowship hour is scheduled for 5:30 p. m. Tuesday morning will be devoted to a joint symposium, "The Pathologist as Supervisor of the Clinical Chemistry Division of the Hospital Laboratory," presented by the College of American Pathologists and the American Society of Clinical Pathologists, with Dr. Frank W. Konzelmann, Washington, D. C., as moderator. A joint fellowship hour, 6-7:30 p. m., will precede the joint banquet at which the distinguished speaker will be Charles F. Kettering, Sc.D., Detroit. A round-table luncheon will be jointly sponsored by the society and the college Wednesday at 12:30 p. m. Under the same joint sponsorship, workshops (Use of Radioisotopes in the Clinical Laboratory, Ophthalmic Pathology, Medical Writing, and Microbiology) and refresher courses (Histochemistry, Dermal Pathology, Bone Marrow Interpretation, and Cytology) will be presented on Saturday.

Academy of Ophthalmology and Otolaryngology.—The American Academy of Ophthalmology and Otolaryngology will hold its 60th annual meeting at the Palmer House, Chicago, Oct. 9-14. All members and guests are invited to a reception honoring Dr. and Mrs. Alan C. Woods, Baltimore, and Dr. and Mrs. Philip E. Meltzer, Boston, Sunday, 4:30 p. m. The honor guest, Sir Norman Gregg, Sydney, Australia, will give an address. The following symposium, "The Uses and Abuses of the Corticosteroids in Ophthalmology and Otolaryngology," will be presented:

General Considerations, Rachmiel Levine, Chicago.
Ophthalmologic Aspects, John M. McLean, New York.
Otolaryngologic Aspects, Aubrey G. Rawlins, San Francisco.

Dr. Frederick C. Cordes, San Francisco, will deliver the 12th Jackson Memorial Lecture, "Failure in Congenital Cataract Surgery: A Study of Fifty-Six Enucleated Eyes," before the section on ophthalmology Tuesday at 9:10 a. m. The 11th Wherry Memorial Lecture, "Local Reactions to Infections and Allergies," will be presented by Dr. Edmund P. Fowler Jr., New York, at the meeting of the section on otolaryngology Wednesday at 2:55 p. m. At the closing meeting of the section on ophthalmology Friday morning Sir Norman Gregg will present "The Relationship of Infections in the Early Months of Pregnancy to Congenital Anomalies." The section on otolaryngology has scheduled symposiums on Menière's disease and on errors in the early diagnosis and treatment of cancer in the upper respiratory tract. The section on ophthalmology will present a symposium on diseases of the optic nerve. At its closing session it will hear an invitational address "The Aging of the Retina" by Prof. A. Pillat, Vienna, Austria, and will view "The Effect of Oxygen on Retinal Vessels" and "Goniodialisis,"

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motion pictures, presented respectively, by Dr. Norman Ashton, London, England, and Dr. Olga Ferrer, Havana, Cuba. Dr. Gunnar Heuser, Montreal, Canada, has been invited to discuss "Stress in Disease" before the opening meeting of the section on otolaryngology Monday afternoon.

Conference on Tuberculosis.—"Tuberculosis, the Job Is Not Done" will be the theme of the 42nd annual meeting of the Mississippi Valley Conference on Tuberculosis at the Hotel Savery, Des Moines, Iowa, Oct. 13-15, under the presidency of Dr. Harold M. Coon, Madison, Wis. The Mississippi Valley Trudeau Society (Dr. Ejvind P. K. Fenger, Oak Terrace, Minn., president), which will have a joint meeting with professional tuberculosis control workers on Thursday, will hold its scientific session Friday when the following program will be presented:

Report on the Present Status of Antimicrobial U.S.P.H.S. Cooperative Study, Harold I. Humphrey, Columbus, Ohio.
Respiratory Diseases Transmitted from Animals to Man, James H. Steele, D.V.M., chief veterinarian, U. S. Public Health Service, Atlanta, Ga.
Fungus Diseases of the Lungs, Norman F. Conant, Ph.D., Durham, N. C.
Bilateral Resection for Pulmonary Tuberculosis, Joseph W. Gale, Madison, Wis.
Pulmonary and Associated Problems in the Aging Population, Martin J. Fitzpatrick, Kansas City, Kan.
Acute Respiratory Diseases—Studies of Recently Identified Respiratory Viruses (Clinical and Epidemiological), William S. Jordan, Cleveland.
Chronic Suppurative Pulmonary Diseases, Medical: Oscar Bigman and Nicholas H. DeJanney, Detroit; Surgical: Hiram T. Langston, Chicago.
Pulmonary Physiology in Clinical Practice, Steven M. Horvath, Ph.D., Iowa City.
Inhalation Therapy in Pulmonary Diseases, Arthur M. Olsen, Rochester, Minn.

Dr. Walter L. Bierring, Des Moines, will preside at a joint evening session about "World Health Problems and Tuberculosis," for which the speakers will be Dr. John D. Steele, immediate past-president, American Trudeau Society, and chief of surgery, Veterans Administration Hospital, San Fernando, Calif., and Dr. Henry Van Zile Hyde, chief of division, international health, U. S. Department of Health, Education and Welfare, Washington, D. C. The Iowa Academy of General Practice will grant five hours of informal credit to physicians attending the day-long medical meeting on Friday.

Clinical Fellowships in Radiation Therapy.—The American Cancer Society Clinical Fellowships in Radiation Therapy are offered in 1956-1957 to qualified graduates in medicine who have already received thorough basic training in the principles and practice of radiation therapy and who desire to spend additional periods of training in that specialty at certain clinics in the United Kingdom, the Scandinavian countries, and France. Fellowships are available to citizens of the United States under 40 years of age who are graduates of recognized medical schools in the United States and who have previously received training in therapeutic radiology acceptable to the American Board of Radiology as credit toward certification. In the selection of applicants, priority will be given to physicians who (1) are already certified by the American Board of Radiology, (2) who have completed the required training in preparation for board examinations but who have not yet taken the examinations, and (3) those who, while intending to complete board requirements and take the examinations, are still in the training period. The annual stipend for fellows in radiation therapy is $4,500, including travel. American Cancer Society fellows in radiation therapy may choose to spend the entire fellowship year in one institution or to divide the time between two or more; in the latter event, however, at least eight months must be served in a single institution in order that a reasonable measure of practical experience rather than observation only may be assured. Candidates will file three letters of recommendation with their application. Further information and application forms may be procured from the American Cancer Society, Inc., Professional Education Section, 521 W. 57th St., New York 19.

Medical Research Fellowships.—The division of medical sciences of the National Academy of Sciences-National Research Council is accepting applications for postdoctoral research fellowships for 1956-1957. These awards are designed to offer research experience for promising individuals who look forward to investigative careers rather than to provide practical experience in the clinical field. Ordinarily fellowships are not granted to persons over 35. The following programs are announced:

Fellowships in Cancer Research: Awarded by the American Cancer Society on recommendation of the committee on growth of the division of medical sciences and available to citizens of the United States for study in all branches of the biological, chemical, and physical sciences and of clinical investigation applicable to the study of growth, typical or malignant.
British American Exchange Fellowships in Cancer Research: Awarded by the American Cancer Society on recommendation by the committee on growth to citizens of the United States for advanced study in Great Britain in specialized fields pertaining to the problem of growth; similar fellowships are awarded by the British Empire Cancer Campaign to young British scientists for research in the United States.
Fellowships in the Medical Sciences: Supported by the Rockefeller Foundation and administered by the medical fellowship board of the division, these awards are open to citizens of the United States and Canada who expect to devote themselves to research in the basic medical sciences.
Fellowships in Tuberculosis: Administered by the medical fellowship board under a grant from the National Tuberculosis Association and designed to promote the development of investigators in fields related to tuberculosis, they are open to citizens of the United States who are graduates of American schools.
Fellowships in Radiological Research: Administered for the James Picker Foundation by the division's committee on radiology, appointments, not limited to citizens of the United States, are open to candidates seeking to gain research skills leading to investigative careers in the field of radiology.

Applications for 1956-1957 under any of these programs must be postmarked on or before Dec. 1, 1955. Fellowships are awarded in the early spring. Application blanks may be obtained from the Fellowship Office, National Academy of Sciences-National Research Council, 2101 Constitution Ave., N. W., Washington 25, D. C.

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Pan-American Convention.—The fourth General Assembly and the fifth Pan-American Medical Social Convention will be held in Bogota, Colombia, under the auspices of the Colombian government and the Medical Federation of Colombia Oct. 15-22. The official topic for the congress is "Mental Hygiene." Round-table discussions on cardiovascular surgery, nutrition, and infection have also been scheduled.

FOREIGN

Belgian Congo Needs a Physician.—According to Melville O. Williams Jr., Ed.D., secretary for missionary personnel of the Board of Missions of the Methodist Church, a physician-surgeon is needed to serve mission hospitals in the central Belgian Congo. Applicants should be experienced in general medicine and surgery and be, preferably, under 35 years of age. A married man with children will be acceptable, as there are both elementary and high school facilities. Persons interested in such a three year missionary term, or those knowing of a possible applicant, are asked to contact Dr. Williams, 150 Fifth Ave., New York 11.

Antitrachoma Drives.—Nearly a million school children in Formosa are being treated in a mass campaign against trachoma under the United Nations Children's Fund. The drive, which began in the fall of 1954 after a pilot project revealed that 50% of the 1,300,000 children in schools were infected with trachoma and 25% were infected with other forms of conjunctivitis, is to be completed in a period of 18 months. A health education program is part of the campaign. Similar mass drives against trachoma are being conducted by UNICEF in Morocco, Tunisia, Yugoslavia, Egypt, and Spain. In Morocco it is hoped that half a million people, including 100,000 children, will be reached by the middle of 1956. In Tunisia 218,000 people were treated for eye disease during 1954. A pilot project is in progress in Egypt, where more than 70% of all the blindness is the result of corneal ulceration complicating acute conjunctivitis in childhood. The pilot project includes education in sanitation and an attempt to control infection-carrying insects, especially Musca sorbens, believed to be an important vector.

CORRECTION

Escherichia Coli.—In Stiles and Weir's Clinical Note in THE JOURNAL, Aug. 20, 1955, page 1432, in the 13th line from the bottom of the first column the words "Endamoeba coli" should have been "Escherichia coli."

MEETINGS

AMERICAN MEDICAL ASSOCIATION: Dr. George F. Lull, 535 North Dearborn St., Chicago 10, Secretary.

1955 Clinical Meeting, Boston, Nov. 29-Dec. 2.

1956 Annual Meeting, Chicago, June 11-15.

1956 Clinical Meeting, Seattle, Nov. 27-30.

1957 Annual Meeting, New York, June 3-7.

NATIONAL CONFERENCE ON PHYSICIANS AND SCHOOLS, Moraine-on-the-Lake Hotel, Highland Park, Ill., Oct. 12-14. Dr. W. W. Bauer, 535 N. Dearborn St., Chicago, Director.

NATIONAL MEDICAL PUBLIC RELATIONS CONFERENCE, Hotel Statler, Boston, Nov. 28. Mr. Leo F. Brown, 535 N. Dearborn St., Chicago 10, Director.

AMERICAN ACADEMY FOR CEREBRAL PALSY, Claridge Hotel, Memphis, Tenn., Oct. 10-12. Dr. Robert A. Knight, 869 Madison Ave., Memphis 3, Tenn., Secretary.

AMERICAN ACADEMY OF DERMATOLOGY AND SYPHILOLOGY, Palmer House, Chicago, Dec. 3-8. Dr. James R. Webster, 55 East Washington St., Chicago 2, Secretary.

AMERICAN ACADEMY OF NEUROLOGICAL SURGERY, The Homestead, Hot Springs, Va., Oct. 27-29. Dr. Eben Alexander Jr., Bowman Gray School of Medicine, Winston-Salem, N. C., Secretary.

AMERICAN ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY, Palmer House, Chicago, Oct. 9-14. Dr. W. L. Benedict, 100 First Avenue Bldg., Rochester, Minn., Executive Secretary.

AMERICAN ASSOCIATION OF BLOOD BANKS, Palmer House, Chicago, Nov. 19-21. Miss Marjorie Saunders, 3707 Gaston Ave., Dallas 10, Texas, Secretary.

AMERICAN ASSOCIATION OF MEDICAL CLINICS, Curtis Hotel, Minneapolis, Nov. 4-6. Dr. Edwin P. Jordan, Box 58, Charlottesville, Va., Executive Director.

AMERICAN ASSOCIATION FOR THE SURGERY OF TRAUMA, Drake Hotel, Chicago, Oct. 27-29. Dr. James K. Stack, 700 N. Michigan Blvd., Chicago 11, Secretary.

AMERICAN CLINICAL AND CLIMATOLOGICAL ASSOCIATION, The Homestead, Hot Springs, Va., Oct. 31-Nov. 2. Dr. M. N. Fulton, 124 Waterman St., Providence 6, R. I., Secretary.

AMERICAN COLLEGE OF ANESTHESIOLOGISTS, Hotel Statler, Boston, Nov. 4-5. Mr. John H. Hunt, 188 West Randolph St., Chicago 1, Executive Secretary.

AMERICAN COLLEGE OF CARDIOLOGY INTERIM MEETING, Hotel Claridge, Memphis, Tenn., Nov. 10-12. Dr. Philip Reichert, Empire State Bldg., New York 1, Secretary.

AMERICAN COLLEGE OF GASTROENTEROLOGY, Hotel Shoreland, Chicago, Oct. 24-26. Dr. Joseph Shaiken, 33 West 60th St., New York 23, Secretary

AMERICAN COLLEGE OF SURGEONS, Conrad-Hilton Hotel, Chicago, Oct. 31-Nov. 4. Dr. Michael L. Mason, 40 East Erie St., Chicago 11, Secretary.

AMERICAN DENTAL ASSOCIATION, San Francisco, Oct. 17-20. Dr. Harold Hillenbrand, 222 East Superior St., Chicago 11, General Secretary.

AMERICAN HEART ASSOCIATION, Yung Hotel, New Orleans, Oct. 22-26. Mr. Irving Hexter, 44 East 23d St., New York 10, Secretary.

AMERICAN MEDICAL WOMEN'S ASSOCIATION, Board Meeting, Netherlands-Plaza Hotel, Cincinnati, Nov. 11-13. Miss Lillian T. Majally, 1790 Broadway, New York 19, Executive Secretary.

AMERICAN PUBLIC HEALTH ASSOCIATION, Muehlebach Hotel and Municipal Auditorium, Kansas City, Mo., Nov. 14-18. Dr. Reginald M. Atwater, 1790 Broadway, New York 19, Executive Secretary.

AMERICAN SCHOOL HEALTH ASSOCIATION, Hotel President, Kansas City, Mo., Nov. 14-18. Dr. A. O. DeWeese, 515 East Main St., Kent, Ohio, Secretary.

AMERICAN SOCIETY OF ANESTHESIOLOGISTS, Hotel Statler, Boston, Oct. 29-Nov. 3. Dr. J. Earl Remlinger Jr., Room 1101, 188 W. Randolph St., Chicago 1, Secretary.

AMERICAN SOCIETY OF CLINICAL PATHOLOGISTS, Drake Hotel, Chicago, Oct. 10-15. Dr. Clyde G. Culbertson, 1040-1232 West Michigan St., Indianapolis, Secretary.

AMERICAN SOCIETY FOR THE STUDY OF ARTERIOSCLEROSIS, Hotel Sheraton, Chicago, Nov. 6-7. Dr. O. J. Pollak, P.O. Box 228, Dover, Del., Secretary.

AMERICAN SOCIETY OF TROPICAL MEDICINE AND HYGIENE, Somerset Hotel, Boston, Nov. 2-5. Dr. John E. Larsh Jr., Dept. of Parasitology, School of Public Health, Chapel Hill, N. C., Secretary.

ASSOCIATION OF AMERICAN MEDICAL COLLEGES, New Ocean House, Swampscott, Mass., Oct. 24-26. Dr. Dean F. Smiley, 185 N. Wabash Ave., Chicago 1, Secretary.

ASSOCIATION OF LIFE INSURANCE MEDICAL DIRECTORS OF AMERICA, Hotel Statler, New York, Oct. 19-21. Dr. Henry B. Kirkland, P. O. Box 594, Newark, N. J., Secretary.

ASSOCIATION OF MILITARY SURGEONS OF THE U. S., Hotel Statler, Washington, D. C., Nov. 7-9. Colonel Robert E. Bitner, 1726 I St. N.W., Washington 6, D. C., Secretary.

ASSOCIATION OF STATE AND TERRITORIAL HEALTH OFFICERS, Hotel Washington, Washington, D. C., Nov. 6-12. Dr. Franklin D. Yoder, State Board of Health, Cheyenne, Wyo., Secretary.

CENTRAL NEUROPSYCHIATRIC ASSOCIATION, The Broadmoor, Colorado Springs, Colo., Oct. 20-22. Dr. Hamilton Ford, 112 North Boulevard, Galveston, Tex., Secretary.

CENTRAL SOCIETY FOR CLINICAL RESEARCH, Drake Hotel, Chicago, Nov. 4-5. Dr. Robert H. Ebert, 950 East 59th St., Chicago 37, Secretary.

COLLEGE OF AMERICAN PATHOLOGISTS, Drake Hotel, Chicago, Oct. 10-15. Dr. Arthur H. Dearing, 203 N. Wabash Ave., Chicago 1, Executive Secretary.

CONGRESS OF NEUROLOGICAL SURGEONS, Hotel Statler, Los Angeles, Oct. 27-29. Dr. Philip D. Gordy, 1007 Delaware Ave., Wilmington, Del., Secretary.

DELAWARE, MEDICAL SOCIETY OF, Delaware Academy of Medicine, Wilmington, Oct. 17-18. Dr. Norman L. Cannon, 621 Delaware Ave., Wilmington, Secretary.

DISTRICT OF COLUMBIA, MEDICAL SOCIETY OF THE, Hotel Statler, Washington, D. C., Oct. 10-12. Mr. Theodore Wiprud, 1718 M St., N.W., Washington 6, D. C., Executive Director.

EASTERN SECTION, AMERICAN FEDERATION FOR CLINICAL RESEARCH, Hotel Warwick and College of Physician's Building, Philadelphia, Dec. 2-3. Dr. Charles R. Shuman, Temple Univ. Hospital, Broad and Ontario Sts., Philadelphia 40, Chairman.

GERONTOLOGICAL SOCIETY, Sheraton-Belvedere Hotel, Baltimore, Oct. 27-29. Dr. Nathan W. Shock, Baltimore City Hospitals, Baltimore 24, Secretary.

GULF COAST CLINICAL SOCIETY, Pensacola, Fla., Oct. 27-28. Dr. Barkley Beidleman, 1750 N. Palafox St., Pensacola, Fla., Secretary.

INDIANA STATE MEDICAL ASSOCIATION, French Lick Springs Hotel, French Lick, Oct. 16-19. Mr. James A. Waggener, 23 East Ohio St., Indianapolis 4, Executive Secretary.

INTER-SOCIETY CYTOLOGY COUNCIL, Statler Hotel, Cleveland, Nov. 11-12. Dr. Paul F. Fletcher, 634 N. Grand Blvd., St. Louis 3, Secretary.

INTERSTATE POST GRADUATE MEDICAL ASSOCIATION OF NORTH AMERICA, Municipal Auditorium, Milwaukee, Nov. 14-17. Mr. Roy T. Ragatz, 207 Gay Bldg., Madison 3, Wis., Executive Director.

MEDICAL SOCIETY EXECUTIVES CONFERENCE, Boston, Nov. 27. Mr. H. Martin Baker, 1102 South Hillside, Wichita 17, Kansas, Secretary.

MIDWESTERN SECTION OF AMERICAN FEDERATION FOR CLINICAL RESEARCH, Thorne Hall, Northwestern University, and Drake Hotel, Chicago, Nov. 3. Dr. Robert J. Glaser, Barnes Hospital, St. Louis 10, Secretary.

MISSISSIPPI VALLEY TRUDEAU SOCIETY, Hotel Savery, Des Moines, Iowa, Oct. 14. Dr. Harold G. Curtis, Sunny Acres, Cuyahoga County Tuberculosis Hospital, Cleveland 22, Chairman, Program Committee.

NATIONAL ASSOCIATION FOR MENTAL HEALTH, Indianapolis, Nov. 4-6. Mr. Robert M. Heininger, 1790 Broadway, New York 19, Director.

OKLAHOMA CITY CLINICAL SOCIETY CONFERENCE, Oklahoma City, Oct. 24-27. Dr. Charles E. Leonard, 512 Medical Arts Bldg., Oklahoma City 2, Secretary.

OMAHA MID-WEST CLINICAL SOCIETY, Hotel Paxton, Omaha, Oct. 24-27. Mrs. Anne K. Ramsey, 1031 Medical Arts Bldg., Omaha 2, Executive Secretary.

REGIONAL MEETINGS, AMERICAN COLLEGE OF PHYSICIANS:

Buffalo, N. Y., Oct. 14. Dr. John H. Talbot, 100 High St., Buffalo 3, N. Y., Governor.

Madison, Wis., Oct. 15. Dr. Frederick W. Madison, 425 East Wisconsin Ave., Milwaukee 2, Governor.

Louisville, Ky., Nov. 5. Dr. Sam A. Overstreet, 332 West Broadway, Louisville, Ky., Governor.

Newark, N. J., Nov. 9. Dr. Edward C. Klein Jr., 6 S. Kingsman Rd., South Orange, N. J., Governor.

Detroit, Dec. 3. Dr. H. Marvin Pollard, 1313 East Ann St., Ann Arbor, Mich., Governor.

Hot Springs, Ark., Dec. 3. Dr. A. A. Blair, 100 S. 14th St., Ft. Smith, Ark., Governor.

SOCIETY OF CLINICAL SURGERY, Hotel Roosevelt, New Orleans, Nov. 11-12. Dr. Frank F. Allbritten Jr., University of Kansas Medical Center, Kansas City, Mo., Secretary.

SOUTHERN MEDICAL ASSOCIATION, Shamrock Hotel, Houston, Texas, Nov. 14-17. Mr. V. O. Foster, 1020 Empire Bldg., Birmingham 3, Ala., Secretary-Manager.

SOUTHERN SOCIETY OF CANCER CYTOLOGY, Houston, Texas, Nov. 14-17. Dr. J. Ernest Ayre, 1155 N.W. 14th St., Miami, Fla., Secretary.

SOUTHWESTERN MEDICAL ASSOCIATION, Westward Ho Hotel, Phoenix, Ariz., Nov. 16-18. Dr. Celso C. Stapp, 800 Montana St., El Paso, Texas, Secretary.

STATE MEDICAL JOURNAL CONFERENCE, Chicago, Nov. 7-8. Mr. Alfred J. Jackson, 535 N. Dearborn St., Chicago 10, Director.

THE CONSTANTINIAN SOCIETY, Sheraton-Park Hotel, Washington, D. C., Oct. 26-29. Dr. C. F. Shook, P. O. Box 1035-36, Toledo 1, Ohio, Secretary.

VIRGINIA, MEDICAL SOCIETY OF, Hotel Jefferson, Richmond, Oct. 16-19. Mr. Robert I. Howard, 105 West Franklin St., Richmond, Executive Secretary.

WESTERN ORTHOPEDIC ASSOCIATION, The Reef, Honolulu, Hawaii, Nov. 7-10. Dr. Ivar J. Larsen, 1133 Punchbowl, Honolulu 13, Hawaii, Secretary.

WESTERN SOCIETY OF ELECTRO-ENCEPHALOGRAPHY, Westward Ho Hotel, Phoenix, Ariz., Nov. 10-12. Dr. Sylvester N. Berens, 902 Boren Ave., Seattle, Secretary.

WESTERN SURGICAL ASSOCIATION, Olympic Hotel, Seattle, Dec. 1-3. Dr. John T. Reynolds, 612 N. Michigan Blvd., Chicago 11, Secretary.

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FOREIGN AND INTERNATIONAL

CONFERENCE OF INTERNATIONAL UNION FOR HEALTH EDUCATION OF THE PUBLIC, Rome, Italy, Apr. 27-May 5, 1956. Mr. Lucien Viborel, 92 rue St. Denis, Paris 1er, France, Secretary-General.

CONGRESS OF INTERNATIONAL ASSOCIATION OF LIMNOLOGY, Helsinki, Finland, July 26-Aug. 7, 1956. For information address: Dr. H. Luther, Snellmansgatan 16 C 36, Helsinki, Finland.

CONGRESS OF INTERNATIONAL ASSOCIATION OF LOGOPEDICS AND PHONIATRICS, Barcelona, Spain, Sept. 3-7, 1956. Dr. J. Perello, Provenza 319, Barcelona 9, Spain, Secretary-General.

CONGRESS OF INTERNATIONAL SOCIETY OF HEMATOLOGY, Hotel Statler, Boston, Mass., U.S.A., Sept. 3-8, 1956. Dr. W. C. Moloney, 39 Bay State Road, Boston, Mass., U.S.A., Secretary.

CONGRESS OF INTERNATIONAL SOCIETY FOR RESEARCH ON ANESTHESIA, Miami Beach, Fla., U.S.A., Mar. 12-15, 1956. For information write: Dr. R. J. Whitacre, 13951 Terrace Road, Cleveland 12, Ohio, U. S. A.

CONGRESS OF LATIN SOCIETY OF OPHTHALMOLOGY, Madrid, Spain, April 24-28, 1956. For information address: Dr. Costi, Montalban 3, Madrid, Spain.

EUROPEAN CONGRESS OF ALLERGOLOGY, Florence, Italy, May 1956. Prof. Umberto Serafini, Largo della Gancia 5, Rome, Italy, Secretary-General.

EUROPEAN SYMPOSIUM ON VITAMIN B_{12}, Hamburg, Germany, May 1956. For information write: Doz. Dr. H. Bauer, Nervenklinik. Hamburg-Eppendorf, Germany.

INTERNATIONAL ACADEMY OF LEGAL AND SOCIAL MEDICINE, Plenary Conference, Genoa, Italy, Oct. 13-17. Prof. Domenico Macaggi, Institut de Medicine legale, Universite de Genes, Genes, Italy, President.

INTERNATIONAL ACADEMY OF PATHOLOGY, Cincinnati, Ohio, U. S. A., April 24-25, 1956. Dr. F. K. Mostofi, Armed Forces Institute of Pathology, Washington 25, D. C., U. S. A., Secretary.

INTERNATIONAL COLLOQUIUM ON CHLORPROMAZINE AND NEUROLEPTIC AGENTS IN PSYCOTHERAPY, Ste Anne Clinic of Mental Diseases, Paris, France, Oct. 20-22. Prof. Jean Delay, College of Medicine of Paris, 1, rue Cabanis, Paris 14e, France, Chairman.

INTERNATIONAL CONGRESS AGAINST ALCOHOLISM, Istanbul, Turkey, Sept. 10-15, 1956. For information address: International contre l'Alcoolisme, Case Gare 49, Lausanne, Switzerland.

INTERNATIONAL CONGRESS OF ALLERGOLOGY, Rio de Janeiro, Brazil, S. A., Nov. 6-13. Dr. Bernard N. Halpern, 197 boulevard St. Germain, Paris 7e, France, Secretary General.

INTERNATIONAL CONGRESS OF ANTHROPOLOGICAL AND ETHNOLOGICAL SCIENCES, Philadelphia, Pa., U. S. A., Sept. 2-9, 1956. Dr. William N. Fenton, National Research Council, Division of Anthropology and Psychology, 2101 Constitution Avenue, Washington 25, D. C., U. S. A., Secretary-General.

INTERNATIONAL CONGRESS ON DISEASES OF THE CHEST, Cologne, Germany, Aug. 19-23, 1956. Mr. Murray Kornfeld, 112 East Chestnut St., Chicago 11, Illinois, U. S. A., Executive Director.

INTERNATIONAL CONGRESS OF GASTROENTEROLOGY, London, England, July 18-21, 1956. Mr. Hermon Taylor, London Hospital, White Chapel, London E.1, England, Honorable Secretary.

INTERNATIONAL CONGRESS FOR THE HISTORY OF SCIENCE, Florence and Milan, Italy, Sept. 3-10, 1956. Dr. M. L. Bonelli, Instituto di Ottica, Arcetri, Florence, Italy, Secretary-General.

INTERNATIONAL CONGRESS OF HYDATID DISEASE, Athens, Greece, Sept. 14-18, 1956. Prof. B. Kourias, Croix-Rouge Hellenique, 1 rue Mackenzie King, Athens, Greece, Secretary-General.

INTERNATIONAL CONGRESS OF INTERNAL MEDICINE, Madrid, Spain, Sept. 19-23, 1956. Dr. J. C. De Oya and Dr. J. Gimena, Hostaleza No. 90, Madrid, Spain, Secretaries.

INTERNATIONAL CONGRESS OF INTERNATIONAL COLLEGE OF SURGEONS, Palmer House, Chicago, Illinois, U. S. A., Sept. 9-13, 1956. Dr. Max Thorek, 1516 Lake Shore Drive, Chicago, Illinois, U. S. A., Secretary-General.

INTERNATIONAL CONGRESS OF INTERNATIONAL SOCIETY OF BRONCHOESOPHAGOLOGY, Buenos Aires, Argentina, S. A., Oct. 28-29. Dr. Juan Carlos Arauz, Cangallo 4015, Buenos Aires, Argentina, S. A., Secretary General.

INTERNATIONAL CONGRESS OF NEO-HIPPOCRATIC MEDICINE, Montecatini, Terme, Italy, May 20-22, 1956. Prof. P. Delore, 13 rue Jarente, Lyon, France, Secretary-General.

INTERNATIONAL CONGRESS OF PAEDIATRICS, Copenhagen, Denmark, July 22-27, 1956. Professor P. Plum, Rigshospitalet, Copenhagen, Denmark, President.

INTERNATIONAL CONGRESS OF PHYSICAL MEDICINE, Copenhagen, Denmark, August 20-24, 1956. Dr. B. Strandberg, Kobenhavns amts sygehus i Gentofte, Dept. of Rheumatology and Physical Medicine, Hellerup, Denmark, Honorable Secretary.

INTERNATIONAL CONGRESS OF RADIOLOGY, Mexico, D. F., Mexico, July 22-28, 1956. Dr. Jose Noriega, Tepic 126 (2e piso), Mexico, D. F. 7, Mexico, Secretary General.

INTERNATIONAL CONGRESS OF WORLD CONFEDERATION FOR PHYSICAL THERAPY, New York, New York, U. S. A., June 17-23, 1956. For information address: Miss Mildred Elson, American Physical Therapy Association, 1790 Broadway, New York 19, New York, U. S. A.

INTERNATIONAL GENERAL MEDICAL CONGRESS, University of Rosario Medical College, Rosario, Argentina, S. A., Nov. 7-12. Dean Jose Imhoff, Santa Fé 3100, Rosario, Argentina, S. A., Chairman.

INTERNATIONAL PHYSIOLOGICAL CONGRESS, Brussels, Belgium, July 29-Aug. 5, 1956. For information address: Prof. J. Reuse, Faculte de Medicine et de Pharmacie, 115 Boulevard de Waterloo, Brussels, Belgium.

INTERNATIONAL PROFESSIONAL UNION OF GYNECOLOGISTS AND OBSTETRICIANS, Madrid, Spain, Sept. 28-29, 1956. Dr. Jacques Courtois, 1 rue Racine, St-Germain-en-Laye (S and O), France, Permanent International Secretary-General.

LATIN AMERICAN CONGRESS OF PATHOLOGY, Mexico, D. F., Mexico, Dec. 11-17. For information address: Laboratorio de Anatomia Patologica, Instituto N. de Cardiologia, Avenida Cuauhtemoc 300, Mexico 7, D. F., Mexico.

NORTH QUEENSLAND MEDICAL CONFERENCE, Cairns, North Queensland, Australia, June 25-30, 1956. Dr. W. R. Horsfall, P. O Box 672, Cairns, N.Q., Australia, Secretary.

PAN AMERICAN CONGRESS OF INTERNATIONAL COLLEGE OF SURGEONS, Mendoza City, Argentina, S. A., Oct. 22-26. For information address: Secretary, Caseros Av. 2154, Buenos Aires, Argentina, S. A.

PAN AMERICAN CONGRESS OF OPHTHALMOLOGY, Santiago, Chile, S. A., Jan. 9-14, 1956. Dr. Rene Contardo, Huerfanos 930, Of. 74, Santiago, Chile, Secretary General.

PAN AMERICAN MEDICAL SOCIAL CONVENTION, Bogota, Colombia, S. A., Oct. 15-22. Dr. Leopoldo E. Araujo, Avenida de los Presidentes Num. 506, Apartado 2589, La Habana, Cuba, Secretary.

PAN AMERICAN MEDICAL WOMEN'S ALLIANCE, Santiago, Chile, March 6-13, 1956. For information address: Dr. Eva Cutright, 458 Beall Ave., Wooster, Ohio, U. S. A.

VENEZUELAN CONGRESS OF MEDICAL SCIENCES, Caracas, Venezuela, S. A., Nov. 18-26. Dr. A. L. Briceno Rossi, Apartado 4412, Ofic. del Este, Caracas, Venezuela, S. A., Secretary General.

WORLD CONGRESS ON FERTILITY AND STERILITY, Naples, Italy, May 18-26, 1956. For information address: Prof. G. Tesauro, S. Andrea della Dame, 19, Naples, Italy.

EXAMINATIONS AND LICENSURE

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: Various Centers. April 24-25 (Part II); June 19-20 (Parts I and II); September 4-5 (Part I). Candidates may file applications at any time but they must be received at least six weeks before the date of the examination for which application is made. New candidates should apply by formal registration; registered candidates may notify the board, indicating desired location, date and candidate number. Ex. Sec., Dr. John P. Hubbard, 133 South 36th St., Philadelphia 4.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: *Examination.* Montgomery, June 19-21. Sec., Dr. D. G. Gill, State Office Bldg., Montgomery.

ARIZONA:* *Examination.* Phoenix, Oct. 12-14. *Reciprocity.* Phoenix, Oct. 15. Exec. Sec., Mr. Robert Carpenter, 411 Security Bldg., Phoenix.

ARKANSAS:* *Examination.* Little Rock, Nov. 10-11. Sec., Dr. Joe Verser, Harrisburg.

CALIFORNIA: *Written.* Sacramento, Oct. 17-20. *Oral and Clinical Examinations for Foreign Medical School Graduates.* San Francisco, Nov. 13. *Oral Examination for Reciprocity Applications.* San Francisco, Nov. 12. Sec., Dr. Louis E. Jones, Room 536, 1020 N St., Sacramento.

COLORADO:* *Examination.* Denver, Dec. 6-7. Final date for filing application is Nov. 4. *Reciprocity.* Denver, Oct. 11. Final date for filing application is Sept. 12. Exec. Sec., Mrs. Beulah H. Hudgens, 831 Republic Bldg., Denver 2.

CONNECTICUT:* *Regular. Examination.* Hartford, Nov. 8-10. Sec., Dr. Creighton Barker, 160 St. Ronan St., New Haven. *Homeopathic.* Derby, Nov. 8-19. Sec., Dr. Donald A. Davis, 38 Elizabeth St., Derby.

DELAWARE: *Examination.* Dover, Jan. 10-12. *Reciprocity.* Dover, Jan. 19. Sec., Dr. Joseph S. McDaniel, Dover.

FLORIDA:* *Examination.* Miami Beach, Nov. 20-21. Sec., Dr. Homer L. Pearson, 901 N. W. 17th St., Miami.

IDAHO: *Examination and Reciprocity.* Boise, Jan. 9-11. Exec. Sec., Mr. Armand L. Bird, 364 Sonna Bldg., Boise.

ILLINOIS: *Examination and Reciprocity.* Chicago, Oct. 11-13. Supt. of Registration, Mr. Fredric B. Selcke, State House, Springfield.

INDIANA: *Examination.* Indianapolis, June. Exec. Sec., Miss Ruth V. Kirk, 538 K. of P. Bldg., Indianapolis.

IOWA:* *Examination.* Des Moines, Dec. 5-7. Ex. Sec., Mr. Ronald V. Saf, State Office Bldg., Des Moines.

KANSAS: *Examination and Endorsement.* Topeka, Dec. 7-8. Sec., Dr. Lyle F. Schmaus, New Brotherhood Bldg., Kansas City.

KENTUCKY: *Examination.* Louisville, Dec. 5-7. Asst. Sec., Mr. R. F. Dixon, 620 S. 3rd St., Louisville.

MAINE: *Examination and Reciprocity.* Portland, Nov. 8-9. Sec., Dr. Adam P. Leighton, Portland.

MARYLAND: *Examination.* Baltimore, Dec. 13-16. Exec. Sec., Miss Hannah A. McCarthy, 1215 Cathedral St., Baltimore 1.

MICHIGAN:* *Examination.* Lansing, Oct. 12-14. Sec., Dr. J. Earl McIntyre, 118 Stevens T. Mason Bldg., Lansing.

MINNESOTA:* *Examination and Reciprocity.* Minneapolis, Oct. 18-20. Sec., Dr. F. H. Magney, 230 Lowry Medical Arts Bldg., St. Paul 2.

MISSISSIPPI: *Reciprocity.* Jackson, December. Asst. Sec., Dr. R. N. Whitfield, State Board of Health, Jackson.

MISSOURI: *Examination and Endorsement.* St. Louis, Oct. 21-22. Exec. Sec., Mr. John A. Hailey, Box 4, State Capitol Bldg., Jefferson City.

NEBRASKA:* *Examination.* Omaha, June 18-20. Director, Bureau of Examining Boards, Mr. Husted K. Watson, 1009 State Capitol Bldg., Lincoln.

NEW JERSEY: *Examination.* Trenton, Oct. 18-21. Sec., Dr. Patrick H. Corrigan, 28 W. State St., Trenton.
NEW MEXICO:* *Examination and Reciprocity.* Santa Fe, Nov. 21-22. Sec., Dr. R. C. Derbyshire, 227 E. Palace Ave., Santa Fe.
NEW YORK: *Examination.* Albany, Buffalo, New York City and Syracuse, Oct. 4-7. Sec., Dr. Stiles D. Ezell, 23 S. Pearl St., Albany.
NORTH CAROLINA: *Reciprocity.* Asheville, Oct. 31. Sec., Dr. Jos. J. Combs, 716 Professional Bldg., Raleigh.
NORTH DAKOTA: *Examination.* Grand Forks, Jan. 4-6. *Reciprocity.* Grand Forks, Jan. 7. Sec., Dr. C. J. Glaspel, Box 228, Grafton.
OHIO: *Reciprocity.* Columbus, Oct. 4. *Examination.* Columbus, Dec. 15-17. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus.
OKLAHOMA:* *Examination.* Oklahoma City, June 5-6. Sec., Dr. E. F. Lester, 813 Braniff Bldg., Oklahoma City.
OREGON:* *Reciprocity.* Portland, Oct. 13-15. *Examination.* Portland, January. Sec., Mr. Howard I. Bobbitt, 609 Failing Bldg., Portland.
PENNSYLVANIA: *Examination.* Philadelphia, January. Acting Sec., Miss Marguerite G. Steiner, Box 911, Harrisburg.
SOUTH CAROLINA: *Examination.* Columbia, Nov. 7. Sec., Mr. N. B. Heyward, 1329 Blanding St., Columbia.
SOUTH DAKOTA:* *Examination.* Sioux Falls, Jan. 17-18. Exec. Sec., Mr. John C. Foster, 300 First National Bank Bldg., Sioux Falls.
TEXAS:* *Examination and Reciprocity.* Galveston, Dec. 1-3. Sec., Dr. M. H. Crabb, 1714 Medical Arts Bldg., Fort Worth 2.
VIRGINIA: *Examination.* Richmond, Dec. 7-9. *Reciprocity.* Richmond, Dec. 6. Final date for filing application is Nov. 21. Address the Secretary, 631 First St. S.W., Roanoke.
WEST VIRGINIA: *Reciprocity.* Charleston, Oct. 10. Sec., Dr. N. H. Dyer, Charleston 5.
WISCONSIN:* *Reciprocity.* Madison, Oct. 21; *Reciprocity and Examination.* Madison, Jan. 10-12; *Reciprocity.* Madison, Spring; *Reciprocity and Examination.* Milwaukee, July 10-12. Sec., Dr. Thomas W. Tormey, Jr., 1140 State Office Bldg., Madison.
ALASKA:* On application. Sec., Dr. W. M. Whitehead, 172 South Franklin St., Juneau.
GUAM. The Commission on Licensure will meet whenever a candidate appears or submits his credentials. Sec., Dr. John E. Kennedy, Agana.
HAWAII: *Examination.* Honolulu, Jan. 9-12. Sec., Dr. I. L. Tilden, 1020 Kapiolani, St., Honolulu.
VIRGIN ISLANDS: *Examination and Endorsement.* St. Thomas, Nov. 8-9. Sec., Dr. Earle M. Rice, St. Thomas.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

DISTRICT OF COLUMBIA: *Examination.* Washington, Oct. 24-25. Deputy, Mr. Paul Foley, 1740 Massachusetts Ave., N.W., Washington 6.
FLORIDA: *Examination.* Gainesville, Nov. 5. Sec., Mr. M. W. Emmel, Box 340, Gainesville.
IOWA: *Examination.* Des Moines, Oct. 11. Sec., Mr. Ben H. Peterson, Coe College, Cedar Rapids.
MICHIGAN: *Examination and Endorsement.* Detroit and Ann Arbor, Oct. 14-15. Sec., Mrs. Anne Baker, 410 W. Michigan Ave., Lansing 15.
OREGON: *Examination.* Portland, Dec. 3. Sec., Mr. Charles D. Byrne, State Board of Higher Education, Eugene.
SOUTH DAKOTA: *Examination.* Vermillion, Dec. 2-3. Sec., Dr. Gregg M. Evans, 310 E. 15th St., Yankton.
TEXAS: *Examination.* Austin and Houston, Oct. 21-22. Sec., Brother Raphael Wilson, 407 Perry-Brooks Bldg., Austin.
ALASKA: On application. Juneau or other towns in Territory as decided by Board. *Reciprocity.* On application. Sec., Dr. C. Earl Albrecht, Box 1931, Juneau.

*Basic Science Certificate required.

MAGAZINE–TELEVISION REPORT

The following list of current medical articles in mass-circulation magazines and forthcoming network television programs on medical subjects is published each week only for the information of readers of THE JOURNAL. *Unless specifically stated, the American Medical Association neither approves nor disapproves of the articles and programs reported.*

TELEVISION

Monday, Oct. 10

NBC-TV, 9 p. m. EDT. "Medic" features a story on medicine's fight against asthma and hay fever entitled "A Room, A Boy and Mr. Bodine."

ABC-TV, 9:30 p. m. EDT. "Medical Horizons" reports on an artificial kidney that takes over renal function during acute emergencies associated with kidney shutdown. Telecast remote from Georgetown University Hospital, Washington, D. C., in cooperation with the American Medical Association.

Wednesday, Oct. 12

NBC-TV, 11:30 a. m. EDT. "Medical and Health News with Howard Whitman," a segment of the "Home" program.

Sunday, Oct. 16

NBC-TV, 3 p. m. EDT. "Dr. Spock," featuring Dr. Benjamin Spock, provides information on child care and development.

Monday, Oct. 17

ABC-TV, 9:30 p. m. EDT. "Medical Horizons" goes to University of Pennsylvania School of Medicine for a program on the training of a medical student.

MAGAZINES

The American Weekly, Oct. 9, 1955

"The Case for the Smoker," by William Engle

The author shows "why some noted cancer experts are not convinced by the reports (that there is a cause and effect relationship between cigarette smoking and lung cancer)."

Parade, Oct. 9, 1955

"Children's Ward: No Place for Tears," by John Devaney

A picture-text story of the children's wards at Johns Hopkins Hospital.

Parents' Magazine, October, 1955

"A Baby's Best Friend Is His Doctor," by Paulette Kahn Hartrich

A list of instructions to mother showing what she should do in order to make her doctor's services more valuable.

"The Truth About Miscarriage," by Alan F. Guttmacher, M.D.

A discussion of abortion and its cause. Treatment for chronic aborters reported by the author include dietary instructions plus thyroid, stilbesterol and progesterone, and psychotherapy plus liberal amounts of vitamins B and C.

Woman's Home Companion, October, 1955

"What's It Worth to Keep Your Child Well?" by Milton J. E. Senn, M.D.

"Both doctors and parents are developing a brand-new conception of the health job." The author tells what a doctor looks for during formative years and what he expects of the parents.

Coronet, October, 1955

"Improve Your Sight Without Glasses," by Lawrence Galton

"Miss Clara A. Hackett . . . has added many techniques to increase the effectiveness of the original Bates (Dr. William A. Bates) methods." The article tells of the success of these techniques for improving eyesight and describes some "major" exercises.

Cosmopolitan, October, 1955

"Witch Doctors and Your Health," by George W. Groh

Medicine scouts employed by major pharmaceutical houses are tracking down tribal remedies in Africa and South America. "Some of these drugs are natural medicines which we can take over without essential change. Others are deadly poisons—the weapon drugs of jungle warriors—which we can adapt to purposes quite different from the native use."

"New Help for Your Skin," by Lawrence Galton

The author lists these "new" treatments for skin diseases: fludrocortisone ointment for eczema; beams of high-energy electrons for atopic dermatitis, disseminated neurodermatitis, and exfoliative dermatitis; high-frequency electric current for acne; grenz rays for psoriasis; and procaine as an anesthetic in scar planing.

Saturday Evening Post, Oct. 1, 1955

"Are Patients Human Beings?" by Milton Silverman

Hospital people are finding they must take care of the "whole man" and "provide warmth, comfort and friendship as well as efficiency in American hospitals." The author reports that "smart hospitals are junking traditional but boneheaded customs like 5 a. m. reveille and payment in advance."

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GOVERNMENT SERVICES

ARMY

Personal.—Col. Dwight M. Kuhns has been named deputy director of the Armed Forces Institute of Pathology.——Col. Bryan C. T. Fenton has been appointed chief of the supply division in the office of the surgeon general, replacing Col. Jenner G. Jones, who has been assigned to the Armed Services Medical Procurement Agency, Brooklyn, N. Y.——Dr. Theodor Wagner-Jauregg has resigned from his position as chief, medicinal chemistry branch, Chemical Corps Medical Laboratories, Army Chemical Center, Md., and will accept a position as chief of the chemical laboratories of the pharmaceutical firm of B. Siegfried, A. G., Zofingen, Switzerland. Dr. Wagner-Jauregg is one of a group of three scientists who came from Germany in 1948 to work for the Chemical Corps. The other two scientists, Dr. Hans J. Trurnit, Medical Laboratories, and Dr. F. W. Hoffman, Chemical and Radiological Laboratories, have become United States citizens.

ATOMIC ENERGY COMMISSION

Research Contracts Announced by AEC.—Award of 175 unclassified life science research contracts in biology, medicine, biophysics, and radiation instrumentation was announced Sept. 6 by the Atomic Energy Commission. The contracts were awarded to universities and private institutions as part of the AEC's policy of assisting and fostering research and development in fields related to atomic energy as specified in the Atomic Energy Acts of 1946 and 1954. Thirty-three of the awards, each for one year, are new projects. Sixteen are in biology, 15 in medical sciences, one in biophysics, and one in radiation instrumentation. One hundred forty-two contract renewals for one year were awarded to allow for continuation of research already in progress. Seventy-nine of these are in biology, 53 in medical sciences, 8 in biophysics, and 2 in radiation instrumentation.

SELECTIVE SERVICE SYSTEM

Processing of Physicians for Military Service.—The Selective Service System on Sept. 1 issued the following bulletin in order to provide an adequate pool of new graduates classified in 1-A to meet the calls by the armed forces for physicians and dentists during the fiscal year 1956: 1. Those physicians who have just completed their internships and recent graduates of dental colleges should be made available to fill special calls in accordance with the regulations as soon as possible. There should be no need for filling anticipated special calls with any special registrants except those of priorities 1 and 2 and the younger registrants of priority 3. 2. Local boards are requested to expedite the classification and physical examination of priority 1 and 2 physicians and dentists and of the younger physicians and dentists of priority 3. 3. Local boards are also requested to expedite the processing of physicians and dentists toward induction as regular registrants in accordance with the provisions of Operations Bulletin No. 88, as amended.

PUBLIC HEALTH SERVICE

Cancer Information Institute.—The National Cancer Institute will conduct a one day Cancer Information Institute for public and parochial secondary school teachers of general science, biology, chemistry, and physics. The institute will be held on Saturday, Oct. 15, in the clinical center of the National Institutes of Health in Bethesda, Md. The program is planned to be of interest and utility to science teachers. A short introduction to the cancer problem will be presented by three National Cancer Institute staff members. Next will be a description of demonstrations, projects, and experiments that will be capable of reproduction in the classroom for assignment to brighter pupils or for extracurricular science club activities. Luncheon may be had in the clinical center cafeteria. Tables will be marked so that teachers with similar interests may meet with staff research specialists. After lunch, teachers will go in small groups to laboratories to meet with research scientists and technicians, examine the laboratory facilities, and discuss teaching-demonstration problems. The last activity of the day will be a panel discussion on how best to bring cancer information into the year's program of study. General science, biology, physics, and chemistry will be represented on this panel. A question-and-answer period will follow.

Grants for Research in Nursing.—Research grants and fellowships in the field of nursing will be available from the Public Health Service in the fiscal year that began July 1, Surgeon General Leonard A. Scheele announced. A total of $625,000 was appropriated by Congress for this purpose. This program is designed to support investigations into ways and means of improving quality of nursing care, training nurses in research methods applicable to nursing problems, and making better use of the limited supply of professional nurses. The grants in most cases will be made directly to universities, hospitals, health agencies, or professional groups, under whose auspices the research projects will be carried out.

The research fellowships will be offered only to nurses for the purpose of receiving special postgraduate training in research methods. Fellowships may be used for graduate research study in universities or for research training provided by any health agency or research center. To be accepted for a fellowship, a nurse must be sponsored by the university or agency where the training will be given. Applications may be submitted to the Division of Research Grants, National Institutes of Health, Bethesda 14, Md.

VETERANS ADMINISTRATION

Personal.—Dr. Paul M. Ireland, presently director of surgical service in the central VA office in Washington, D. C., has been appointed manager of the VA hospital in Ann Arbor, Mich.——Dr. Claud E. Carter, presently manager of the VA hospital in Fort Bayard, N. Mex., has been appointed manager of the VA hospital at Butler, Pa.——Dr. Charles S. Livingston, presently manager of the VA hospital at Butler, Pa., has been appointed manager of the VA hospital at Batavia, N. Y.

MISCELLANEOUS

New Radiochemistry Laboratory.—A new radiochemistry laboratory for preparing and distributing standard samples of radioactive materials has been established at the National Bureau of Standards. The resources of this laboratory are expected to expedite greatly the bureau's program of radioactive sample distribution. As custodian of the nation's standards of radioactivity, the National Bureau of Standards carries on a broad research and development program aimed at producing the radioactive standards required by the medical, scientific, and commercial users of radioactive materials. The new radiochemistry laboratory is one of six related facilities that have been established at the bureau to provide this service. The other five consist of laboratories for performing alpha-ray measurements, radioisotope standardization, nuclear spectroscopy, radon testing, and gamma-ray measurements. The radiochemistry laboratory is primarily responsible for the preparation, maintenance, and distribution of about 57 different radioactive nuclides and ores. Included in this group are carbon-14, sodium-22, phosphorus-32, cobalt-60, iodine-131, and gold-198. New uses for these and other nuclides in industry, physics, and medical research and therapy have increased tremendously the demand for standard samples of radioactivity. The program of the radiochemistry laboratory is expected to increase steadily as a result of the expanding uses of radioisotopes in medicine and as biological and industrial tracers. Further work is expected on the program to intercompare radioactive standards and methods of measurement with Canada and Great Britain and other countries. It is planned that international standards of a number of nuclides be established, beginning with phosphorus-32 and cobalt-60.

DEATHS

Peterson, Carl Melancton ✦ Chicago; born in Rockford, Ill., Dec. 6, 1899; University of Minnesota Medical School, Minneapolis, 1927; in private practice from 1927 to 1930, when he became staff associate of the Council on Medical Education and Hospitals of the American Medical Association; since 1938 has served as Secretary of its Council on Industrial Health; specialist certified by the American Board of Preventive Medicine; member of the medical committee, Industrial Hygiene Foundation, small business committee of the National Safety Council, medical advisory board, Welfare and Retirement Fund, United Mine Workers of America, medical committee and executive committee of the President's Committee on Employment of the Physically Handicapped, medical advisory council, American Association of Industrial Nurses, expert advisory panel on occupational health, World Health Organization, United States committee, International Congress of Industrial Medicine, and the committee for industry, Industrial Council for Tropical Health; member of the board of directors and research committee of the Midwestern Air Pollution Prevention Association, Inc.; member of the rehabilitation committee of the council on community service and education of the American Heart Association, the committee on industrial health of the Illinois State Medical Society, and the advisory committee to the literature abstract service for industrial medicine of the Illinois Society for Mental Health, Inc.; chairman of the international committee on occupational health services of the World Medical Association; member of the medical advisory committee of the Common Cold Foundation and of the publication committee of the American Academy of General Practice; chairman of the committee on industrial health and rehabilitation of the Chicago Heart Association; served as chairman on the subcommittee on occupational medicine of the Institute of Medicine of Chicago; member of the American Industrial Hygiene Association; fellow of the American Public Health Association, American Academy of Occupational Medicine, American Academy of Compensation Medicine, and the Industrial Medical Association; member of the editorial board of the *Archives of Industrial Health*; died in the Margaret R. Pardee Memorial Hospital in Hendersonville, N. C., Sept. 27, aged 55, as the result of injuries received in an airplane crash.

Adams, James Harlan ✦ Wichita, Kan.; Kansas City (Mo.) Hahnemann Medical College, 1914; died Aug. 17, aged 80, of carcinoma of the prostate.

Adams, William Alfred ✦ Akron, Colo.; Kansas Medical College, Medical Department of Washburn College, Topeka, 1897; an associate member of the American Medical Association; died June 2, aged 81, of carcinoma of the prostate and coronary occlusion.

Alexander, James Ramsey ✦ Charlotte, N. C.; University of Maryland School of Medicine, Baltimore, 1894; at one time superintendent of the Presbyterian Hospital; died July 22, aged 85, of rupture of the abdominal aorta and arteriosclerosis.

Bentley, Roy Leighton, Stanton, Mich.; University of Michigan Homeopathic Medical School, Ann Arbor, 1893; served as school director and as bank president; died Aug. 25, aged 85, of coronary occlusion.

Block, Charles ✦ Newark, N. J.; Hahnemann Medical College and Hospital of Philadelphia, 1942; received the Bronze Star for gallantry in action during World War II; interned at the Newark Beth Israel Hospital, where he died Aug. 14, aged 39, of myocardial infarction.

Buckley, Frederick Herbert, Rochester, N. Y.; Syracuse University College of Medicine, 1914; member of the Medical Society of the State of New York; died Aug. 10, aged 69.

Cunnane, Thomas Bartholomew ✦ Los Angeles; College of Physicians and Surgeons, Los Angeles, 1917; associate clinical professor of medicine at the University of Southern California School of Medicine; fellow of the American College of Physicians; member of the Los Angeles Heart Association; fellow of the Los Angeles Academy of Medicine; on the staff of the Good Samaritan Hospital, where he died Aug. 28, aged 60, of myocardial infarction and coronary thrombosis.

Dickens, William Mason ✦ Waco, Texas; University of Tennessee College of Medicine, Memphis, 1911; veteran of World War I; served during World War II; formerly member of the state board of health; chief medical officer of the Veterans Administration regional headquarters in Waco; died in Brownwood July 28, aged 67, of coronary occlusion.

Eliscu, Frederick ✦ St. Joseph, Mo.; Northwestern Medical College, St. Joseph, 1893; also a graduate in pharmacy; at one time an instructor in physical diagnosis at the Central Medical College; past-president of St. Joseph Medical Society; during World War I medical examiner for men entering military service; died in Missouri Methodist Hospital Aug. 24, aged 87.

Feldman, Samuel Hyman ✦ Chelsea, Mass.; Tufts College Medical School, Boston, 1924; died in the Beth Israel Hospital, Boston, Aug. 10, aged 59.

Fischer, Charles ✦ Philadelphia; Temple University School of Medicine, Philadelphia, 1914; an associate member of the American Medical Association; on the staffs of the Frankford and Episcopal hospitals, and St. Christopher's Hospital for Children; died Aug. 15, aged 75, of coronary occlusion.

George, John Henry, Lexington, Mo.; Kansas City (Mo.) Medical College, 1896; died July 27, aged 88, of senility.

Hecht, Max, Crompond, N. Y.; Long Island College Hospital, Brooklyn, 1914; died May 23, aged 69, of acute coronary thrombosis.

Kaluza, Ernst Karl, Poughkeepsie, N. Y.; Universität Heidelberg Medizinische Fakultät, Baden, Germany, 1922; on the staff of St. Francis Hospital; died June 25, aged 58, of cancer.

Lyon, William Edwin, Des Moines, Iowa; State University of Iowa College of Medicine, Iowa City, 1897; died in the Veterans Administration Hospital, Knoxville, Aug. 3, aged 83, of arteriosclerosis.

Martin, John Franklin, Latimer, Iowa; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1912; for many years mayor and county coroner of Latimer; served on the board of education; member of the staff of the Lutheran Hospital in Hampton, where he died May 3, aged 68, of myocardial infarction.

Peter, Arthur Louis, Alhambra, Calif.; Denver College of Physicians and Surgeons, 1900; served during World War I; died in Huntington Memorial Hospital, Pasadena, Calif., May 17, aged 79, of cerebral thrombosis.

Pheips, Marcus ✦ Leitchfield, Ky.; University of Louisville Medical Department, 1907; died July 24, aged 74.

Snead, Nash P. ✦ Cartersville, Va.; Medical College of Virginia, Richmond, 1893; died July 7, aged 81, of embolism and diabetes mellitus.

Stein, Louis Arthur ✦ Trenton, N. J.; New York Homeopathic Medical College and Flower Hospital, New York City, 1916; on the staff of the William McKinley Hospital, where he died July 18, aged 62, of acute myocardial infarction.

Taylor, Eugene Arthur, Washington, D. C.; University of Virginia Department of Medicine, Charlottesville, 1908; member of the Medical Society of the District of Columbia; for many years on the staff of the Episcopal Eye, Ear, and Throat Hospital; died July 22, aged 71, of acute coronary thrombosis.

Thompson, Clarence George ✦ Norwichtown, Conn.; New York Homeopathic Medical College and Flower Hospital, New York City, 1919; director of health, Norwich, Preston, and Ledyard; on the staff of the William W. Backus Hospital in Norwich, where he died May 6, aged 66, of cancer.

✦ Indicates Member of the American Medical Association.

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FOREIGN LETTERS

BRAZIL

Brucellosis and Blood Transfusions.—Brucellosis is one of the diseases that may be transmitted by a blood transfusion. Trying to determine the frequency of brucellosis in donors that come to the blood bank at the Hospital das Clinicas of the University of São Paulo, Dr. Carlos da Silva Lacaz and his co-workers performed a serologic survey (*Rev. Assoc. med. brasil.* **1**:385 [July] 1955). The results of rapid and slow serum-agglutinations showed the incidence of positive reactions to be very low. The material used in these tests was from donors considered to be perfectly healthy. Using the rapid test of Huddleston and considering a titer of 1:100 significant, 9 positive reactions (1.07%) were obtained in a series of 839 donors. The slow serum agglutination test revealed only two positive reactions, or 0.2% in a titer of 1:160. The readings of serum-agglutinations after centrifugation (Hall and Manion technique) favored the development of false positive reactions. The surface fixation test of Castañeda was negative in all those on whom it was performed in titers higher than 1:40. Although the transmission of brucellosis by the transfusion of blood has been demonstrated in rare cases, the problem is of little practical interest because the disease is not common here. Even so, those who slaughter hogs, workers in refrigerators, butchers, and veterinarians, and all those with suspected brucellosis should be rejected as donors, or rapid serum-agglutination, being easy to do, should be performed on such persons in the blood banks.

Q Fever.—The first clinical case of Q fever in São Paulo is reported by Dr. L. A. Ribeiro do Valle and his co-workers in *Rev. paulista de medicina* (**46**:447 [June] 1955). In this patient the onset was sudden with headache, malaise, fever, productive cough, and sharp cutting pain on the left side of the chest. Later the patient complained of diarrhea, vomiting, and abdominal pain. On the 10th day of the disease, at the time of the patient's admission to the hospital, an area of slight dulness, fine crepitant rales, and increased tactile fremitus was observed at the base of his left lung. Roentgenograms taken at intervals of several days revealed the findings of an atypical pneumonia. The cause of the disease was established by serologic tests. A significant increase of the complement-fixing antibody titer for Q fever was shown by testing four patient's blood samples collected during different stages of the illness. The complement-fixing antibody titer for the viruses of the psittacosis-lymphogranuloma venereum group was constant in all the blood samples tested. The cold agglutination test was negative as well as the hemagglutination test for influenza A and B.

ENGLAND

Legal Liability in the National Health Service.—Until the introduction of the National Health Service the courts of England and Scotland held that medical practitioners should accept full responsibility in law for the treatment of their patients. Hospital physicians were not considered servants of the hospital in which they worked and were therefore also held legally responsible for their professional actions. Recently, a number of judgments in the courts has shown that this view has been radically changed. Thus, Lord President Cooper in a decision last year expressed the view that "under the new Act and regulations the obligation on the State is to treat the patient and not merely to make arrangements for his treatment by and at the sole responsibility of independent contractors." Lord Justice Denning, giving judgment in a case involving the professional actions of an orthopedist, said: "Whatever may have been the position of a consultant in former times, nowadays, since the National Health Service Act, the term 'consultant' does not denote a particular relationship between a doctor and a hospital. . . . Whether he is called a specialist or consultant makes no difference. He, like the rest of the staff, is merely carrying out the duties of the Minister." The Central Consultants and Specialists Committee of Scotland has circulated a memorandum to all medical practitioners in Scotland. The memorandum states that the National Health Service, whether by intention or not, has established a state hospital service, the medical personnel of which are now state servants in law. This raises important issues, because physicians entered into contract with the new hospital boards established by the act on the assurance that there would be no change in their relationship with the hospital authorities.

The committee states that it does not consider that hospital boards are likely to want to interfere deliberately with clinical discretion but thinks that they may be compelled to lay down rules or procedure for certain categories of medical staff as a safeguard to compensation claims by patients. To support this view the committee quotes a recent case in which legal liability for damages was assigned to the hospital authority because it had allowed a junior medical officer to give a particular anesthetic, with disastrous results. The committee thinks that any form of control on the part of hospital authorities would hamper routine hospital work and the teaching and practice of medicine in the hospitals. Once any form of control or direction is started it is hard to foresee where it would stop. Hospital records are now no longer secret and confidential. Hospital authorities require for legal purposes that medical records be submitted to their own solicitor before passing them on. At present, this incursion of the state has been limited to the sphere of the hospital, but there is no reason why this doctrine of state responsibility should not be extended to the care of patients treated under the National Health Service outside hospitals. If it did, all physicians under contract with the National Health Service would be servants of the state or of local authorities. The committee has invited the Joint Consultants Committee to endeavor to reestablish in law the previous relationship of hospital physicians to the management of hospitals in which they work. This would involve an approach to the Ministry of Health demanding legislative action. As Parliament would have to be satisfied that a change would not jeopardize a patient's legal right to damages when negligence had been proved, governmental agreement to this change would probably be conditional on all hospital medical personnel belonging to a medical protective society, or some other equivalent insurance, as a condition of employment. Although it is recognized that this almost amounts to trade unionism, its acceptance would seem justifiable. The alternative would be the surrender of professional freedom.

Radiographic Use of Edathamil.—The water-soluble chelated compound, lead sodium edathamil, has been shown by Sapeika (*Brit. M. J.* **2**:167, 1955) to be of value as a contrast medium for oral and parenteral administration. Edathamil itself is a chelating agent and has been used in the treatment of poisoning by heavy metals such as lead. Results from laboratory studies suggest that lead edathamil might be of practical value for radiographic purposes in man, since dense shadows are obtained with it and its administration by intravenous injection causes no untoward side-effects in the doses likely to be required as a contrast agent. Lead sodium edathamil is soluble in water and being un-ionized does not give the usual reactions of ionized lead; it is therefore nontoxic. Oral administration allows visualization of the esophagus. Administration of 15 cc. of a 50% solution produced renal shadows within three minutes lasting for 30 to 40 minutes. The results are equal to those after use of diodone. A solution of lead sodium edathamil may also be used for visualization of the nasal sinuses, which are filled by displacement in Parkinson's lateral low head position. The lead compound does not appear to irritate the gastrointestinal tract, but, because it produces black stools, due presumably to lead sulfide, this method should be used with caution.

The items in these letters are contributed by regular correspondents in the various foreign countries.

Alkaloids of Rauwolfia.—The alkaloid reserpine, obtained from Rauwolfia serpentina, has been widely used as a hypotensive agent. Unfortunately, a number of patients receiving reserpine complain of side-effects, such as depression, lassitude, drowsiness, rhinorrhea, and nightmares. Another alkaloid, rescinnamine, has recently been isolated from R. serpentina, and its value in hypertensive patients, particularly with regard to side-effects, has been assessed by Smirk and McQueen (*Lancet* **2**:115, 1955). Preliminary observations suggest that an appreciable number of patients under treatment with reserpine who complained of side-effects were relieved of these symptoms by changing to rescinnamine; however, some of these patients suffered from tenseness, anorexia, and abdominal discomfort and preferred to return to reserpine. There was no important difference between the hypotensive effects of the two alkaloids. The central effects of reserpine have been used by Davies and Shepherd for the treatment of anxious and depressed patients (*Lancet* **2**:117, 1955). These patients fared better than did a control group treated with a placebo. Four patients with severe involutional melancholia were unchanged, and the authors believe that reserpine is unlikely to supersede electroshock treatment as the treatment of choice for severe depressive states.

Illicit Drug Traffic.—Illicit drug traffic in Great Britain is very limited, according to a report from the government to the United Nations. Traffic in opium, which is largely confined to the Chinese, is waning, and there is no evidence of synthetic narcotics being unlawfully diverted from their normal channels. Seizures of marihuana markedly increased last year, when 118 kg. (260 lb.) was confiscated. Marihuana is used in Britain mainly by Africans, West Indians, or Asiatics. Known drug addicts in Britain, with a population of about 50 million, number only 317, of whom 148 are men and 169 women. Of the men 66 were physicians, but of the women only 3. Morphine was the drug of addiction in 65% of the cases of known addiction, pethidine (meperidine) in 16%, and heroin in 17%. Only two firms, both in Edinburgh, are licensed to manufacture heroin. In Canada, with a population of 14 million, the number of drug addicts is 3,212, according to an estimate in the recent report to the senate by the Reid Committee on the traffic in narcotic drugs. Half of the 2,364 "criminal addicts" are in Vancouver, the police department of which has been charged with laxity in administration of the drug laws. There is practically no juvenile addiction in Canada, only 26 of the addicts being under 20 years of age.

Detection of Chromosomal Sex.—The skin biopsy test of chromosomal sex is being used with increasing frequency as an aid to differential diagnosis in errors of sex development. The epidermic nuclei in females contain a mass of sex chromatin, but in the epidemic nuclei of males the corresponding mass is inconspicuous. Moore and Barr of the University of Western Ontario, London, have shown that smears from the oral mucosa can be used for the chromosomal determination of sex (*Lancet* **2**:57, 1955). They claim that difficulty is sometimes encountered in obtaining skin sections showing fine nuclear detail. The preparation of mucosal smears has the advantage of simplicity. Both workers independently examined a series of 140 smears without reference to the sex of the subjects from whom they were obtained. The sex was correctly diagnosed in 100% of cases by both examiners. They claim that smear preparations are easier to obtain and interpret than are skin biopsies.

Settlement Out of Court.—Mr. Justice Pilcher, giving judgment on July 1 in an action against a hospital management committee, suggested that in certain cases it might be advisable for committees to make a small payment to plaintiffs without any admission of liability rather than having experienced physicians "dragged through the courts." On the previous day he had warned against actions taken against individual physicians or hospital management committees for negligence in cases where damages were likely to be small.

Malaria.—Although rife in the 17th century, malaria has disappeared in Great Britain. Malaria-carrying mosquitoes have recently appeared in Gosport, near Portsmouth, and cases of malaria have been reported in the district. Navy, Army, and Air Force medical departments are joining the local health officers to stamp out the threat. Mosquitoes tend to breed heavily in the area because of the prevalence of stagnant or slow-moving waters. Householders have also been warned of the danger and told how to use sprays to keep their numbers down.

SWITZERLAND

Cancer of the Respiratory System.—Dr. M. Pascua, Director-Consultant on Health Statistics, World Health Organization (*Bull. World Health Organ.* **12**:687, 1955), reviewed the mortality statistics for cancer of the respiratory system for the years 1949 to 1952 in 10 European and 5 non-European countries. The levels of recorded mortality from malignant tumors of the respiratory system, for either sex, differ greatly between countries, and the death rate from these causes has risen markedly, mainly in men, in those countries in the course of the four years under study. The author concludes that the divergency between countries may be caused, apart from different age and sex distribution of the populations, by variations in medical facilities, reliability of cause-of-death certification, and perhaps the proportion of population living in urban and rural areas. The rate of increase was much sharper in some countries for men. Women showed in some of the countries no significant increase or no increase at all. This study, even with its limited scope, would not favor the idea that improvements in diagnosis and in reporting causes of death (although these may be factors) is the chief cause of the increase. Also, the drop in mortality from tuberculosis and from some other respiratory diseases may have facilitated the diagnosis of cancer otherwise masked by the symptoms of such diseases. Some real increase in bronchopulmonary cancer has occurred in the last few years, but the reasons for this are not clear. The aging of the male population cannot be made primarily responsible for the increase observed. While this rise has mainly occurred in tumors of the trachea, bronchus, and lung, a similar inference for women is not apparent or clearly substantiated. Mortality from cancer of such accessible sites as the nasal cavities, middle ear, sinuses, and larynx has not increased during this period. The increased mortality from respiratory cancers has generally been concentrated in the age span 40 to 85 years.

International College of Allergists.—At the second meeting of the International College of Allergists in Basel in July, Wolff of New York distinguished three phases in the migraine attack: the vasoconstrictor, the vasodilator, and the edematous. The aura, often a scotoma, is attributed by the author to vasoconstriction of the retina or calcarine cortex. He stated that vasoconstriction can be seen and photographed in the retina, that during this phase the vessels of the bulbar conjunctiva are narrowed and abnormally sensitive to arterenol that is applied locally, and that the scotoma can be relieved temporarily by vasodilator drugs such as amyl nitrite. Vallery-Radot of Paris stated that, during the phase of headache, ergotamine tartrate, by subcutaneous or intramuscular injection, was the most efficacious agent. In doses of 1 mg. it can also be given orally in combination with 100 mg. of caffeine or, if vomiting is troublesome, as a rectal suppository of 2 mg. of ergotamine and 100 mg. of caffeine. Krayenbuhl of Zurich thinks that to prevent attacks dihydroergotamine is the most efficacious drug in patients showing vasomotor instability, while in attacks possibly related to epilepsy, a combination of Mesantoin and caffeine is best.

Storck, Hoigne, and Grossman of Zurich presented a new serologic method for identifying allergens. They had shown previously that an allergen added to a sensitized serum would cause conglomeration of the platelets. They now showed, using a sensitive nephelometer, that adding an allergen to a sensitized serum causes turbidity at certain dilutions of the allergen. They also demonstrated that the capacity of serum to react with the allergen is due to the presence in it of a specific factor that reacts only with the allergen and that dialyzes through cellophane and a nondialyzable, nonspecific factor that is present in the serum of guinea pigs, cows, and horses but is absent from that of rats and rabbits.

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Familial Bilateral Nephropathy.—Although the importance of heredity in persons with polycystic kidney, malformations of the kidney pelvis, renal dystopia, and changes in renal form and volume is recognized, the role of this factor has not been pointed out in bilateral medical nephropathy. M. Poli (*Helvet. med. acta* **22:**109, 1955) has studied one family with nephropathy for several years. Of 92 members, 28 living during the period of observation were examined. Albuminuria was a constant finding in 16 (56.9%) and hematuria in 17 (60.8%). Eight surely, and probably 10, had died of this disease. Autopsy of a 20-year-old patient who died of uremia showed that the disease was of a highly atypical nature. It differs from malignant nephrosclerosis in that the vascular lesions are milder and from albuminuric and membranous nephritis in that the basement membranes are not so thick, not to mention the wholly different clinical findings. Anatomically, bilateral medical nephropathy most closely resembles subacute ascending pyelonephritis, except for the lack of pyuria. Thus this family were all affected with a disease of relatively uniform clinical development, always commoner among the men and characterized by the following symptoms: (1) early appearance of slight albuminuria, (2) progressive development of urinopathy with hematuria as the leading symptom, (3) late appearance of hypertension correlating with the severity of the renal lesion, (4) late appearance of nitrogen retention, hyposthenuria, and glomerular filtration insufficiency, and (5) late death from renal insufficiency and uremia.

Pulmonary Staphylococcia.—Among the manifestations of superinfection observed during antibiotic therapy, the mycoses (notably those with Candida albicans) and the staphylococcias are well known. The best known complication caused by Micrococcus (Staphylococcus) pyogenes var. aureus is pseudomembranous enterocolitis. Complications occurring in the lungs have had less attention, despite reports by Jackson and co-workers on the changes in sputum flora in patients treated with the tetracyclines. At a meeting of the Swiss Society of Internal Medicine in Geneva in May, Rentchnick and Wolhers reported a case of this enterocolitis after oxytetracycline therapy. A later development was pulmonary localization producing the findings of a tuberculous cavity. In view of the patient's poor general state, wasting, and fever, this diagnosis was possible but was finally excluded when no tubercle bacilli were found in the sputum and M. pyogenes aureus were found. Intensive erythromycin therapy caused rapid clinical improvement with return of appetite and weight gain. The cavity, however, persisted for eight months. It was no doubt a residual cyst. This case shows that micrococcic lesions have entered on a new era as the result of antibiotic therapy. Visceral and osseous localizations are possible, calling for new skills in diagnosis and treatment. Roentgenograms of the chest must be made in patients with enterocolitis from micrococci.

Rare Form of Hyperthyreosis.—Up to 1938 there was no literature on the repercussions of the acromegalothyroid complex on the gross and microscopic morphology of the skeleton. At that time, independently of one another, Troell of Sweden and Junet of Geneva studied this matter. The Troell-Junet syndrome consists of acromegaly, toxic goiter (usually nodular), diabetes mellitus, and hyperostosis of the cranial vault. So far it has been reported only in women. It seems that a hypophysial adenoma uncomplicated by goiter is incapable of producing the cranial thickening. Hyperthyroidism without acromegaly has shown no other hyperostotic picture than the highly localized one of nebula frontalis. The coexistence of these two affections is common to all the cases reported by Troell, Moore, Davis, and Junet. It is to be expected that the syndrome will appear more frequently in a country like Switzerland, where goiter is endemic, than in countries where it is rare. Microscopic examination of bone tissue shows intense osteogenic activity in the periosteum and endosteum. In a patient recently described by Junet, there was generalized spongy transformation of the skeleton. This finding allows for differentiating between the anabolic effect of the hypophysial growth hormone and a catabolic effect presumably resulting from hypersecretion on the part of the proliferating goiter.

Cortisone for Leukemia.—Present therapy of acute leukemia combines blood transfusions with 200 to 300 mg. doses of cortisone and an antimitotic drug (aminopterine or 6-mercaptopurine). In certain fulminating cases with swift deglobulization and hemorrhage, a drastic increase in cortisone dosage was tried recently. One gram was given, then two, and then up to five. H. Dubois-Ferrière treated a 19-year-old man with acute leukemia with 3 gm. of cortisone a day for eight days consecutively. In 10 days, complete clinical, hematological, and medullary remission was obtained. There is no satisfactory explanation of how this remission could occur unaccompanied by the secondary effects caused by doses 10 to 20 times smaller. There was no fluid retention in this patient, nor was there any disorder of his electrolyte metabolism. Only slight rounding of the face appeared. The long range value of this procedure is not known, but it is a promising treatment for emergencies in acute leukemia (*Méd. & hyg.* **13:**318, 1955).

TURKEY

Cerebral Hemangioma.—In *Tib Dünyasi (Medical World,* vol. 25, no. 4) Polvan and Kerimoglu described a 31-year-old man who complained of intermittent muscular tremors in the left arm and syncope. These were first noted on the day his mother died. The syncope had lasted half an hour and was followed by numbness in his left arm. Since then he had had these attacks four or five times a week when he was worried. Vertigo, headache, and tremor in the arm preceded the attacks. On the day after admission to the hospital he had an epileptic seizure. The onset was marked by tremor in the left hand and arm and passed from the left to the right side of the face; after the epileptic cry he had severe clonicotonic convulsions and loss of consciousness. There was incontinence during the crisis, and the patient did not bite his tongue. He had a positive bilateral Babinski sign. Confused consciousness returned after 20 minutes. On admission the muscle tonus of his left hand was 80% below that of his right. After an attack he had pain, numbness, and tingling in his left arm. Pressure on his fourth cervical vertebra elicited pain and a feeling of warmth in his left arm and hyperesthesia, astereognosis, and dermalaxia in his left hand. He had diapasonic anesthesia and defective orientation. Percussion of the cranium elicited a right parieto-occipital dulness. The patient had difficulty moving his head and he had dysdiadochokinesia of the left hand. His IQ was 50 (Binet-Terman test). The spinal fluid pressure, when seated, was 45 mm. H_2O and when recumbent, 22. Roentgenograms revealed a mass the size of a small orange in the right posterior parieto-occipital region. Several formations pointing in different directions and of different densities were seen in its interior. The right side of the face was slightly less developed than the left. Electroencephalography recorded 20 to 75 μv, 8 to 12 alpha waves, 14 to 20 cps frequency, and 14 to 30 cps μv beta waves. A diagnosis of cerebral hemangioma was made. The patient refused operation.

Quinacrine for Teniasis.—In *Dirim* (vol. 30, no. 7) Özgen and Tartaroglu described how a patient expelled five Taenia saginata after treatment with quinacrine. This 38-year-old woman had been advised to include plenty of meat in her diet because of a history of pulmonary tuberculosis. She was admitted because of hypertension of three years' duration. She also mentioned that she expelled tapeworm segments in her stools. On an empty stomach and by means of a duodenal catheter, bile was removed and 0.9 gm. of quinacrine, dissolved in 150 cc. of distilled water, was directly introduced into the small intestines. After half an hour this was followed by the introduction, again through the catheter, of 30 gm. of magnesium sulfate. Half an hour later the patient expelled five scolexes of T. saginata. The worms measured 2 to 3 m. The authors have used this therapy many times and only once encountered two scolexes in one patient. Introduction of quinacrine through the catheter proved effective in all cases and no toxic reactions were observed.

CORRESPONDENCE

PERCUTANEOUS SPLENOPORTOGRAPHY

To the Editor:—In THE JOURNAL of June 11, 1955, page 478, Dr. T. B. Reynolds, Dr. W. Mikkelsen, and Dr. A. G. Redeker in an article, "Splenic Hemorrhage Following Percutaneous Splenoportography," report their experience on splenoportography employed in three cases. After the percutaneous injection of the contrast medium into the spleen, they have observed in the first case a significant subcapsular hematoma; in the second injection, done during surgery, a brisk bleeding controlled by pressure; and, in the third injection, a significant splenic hemorrhage (1,500 cc. of liquid blood in the peritoneal cavity and a large hematoma distending the splenic capsule) that required a splenectomy. They conclude that the procedure is more hazardous than the reports of the literature indicate and because of the splenic hemorrhage facilities for splenectomy must be available.

I was astonished in reading this article. I have done almost 150 splenoportographic examinations in both normal cases and many different pathological conditions of the spleen, pancreas, and liver. Part of my experience has been published (Catalano, D., and Giardiello, A.: Splenic Venography, *Am. J. Roentgenol.* **73:**971-973 [June] 1955; Catalano, D., Giardiello, A., and Ruggiero, A.: Hepatography After Percutaneous Lieno-Portal Venography, *Acta radiol.* **43:**285-288 [April] 1955). We have never had a significant complication. In some of our cases, in which surgical procedure was performed after the roentgenological examination, we could find a laceration of the splenic parenchyma at the site of the injection and in very few of them a small subcapsular hematoma or a few cubic centimeters of blood in the peritoneal cavity. Our experience is confirmed by others, including Abeatici and Campi, Leger (more than 200 splenoportographies), Bourgeon and co-worker, Fuld and Irwin, Caroli and Porcher, Sotgiu and co-workers, and Leroux and de Scoville.

Although we must be grateful to Dr. Reynolds and co-workers for their report that will make us more cautious in performing this procedure, we think because of our experience that splenoportography is without serious complications. The value of the examination is very well known and is unquestionable. Of course, like other vascular contrast studies, it must be performed only in selected patients where useful information may be obtained. Another question that must be taken into consideration is the risk of injection of contrast medium into the peritoneal cavity, referred to by Dr. L. G. Rigler and Dr. P. C. Olfelt (Abdominal Aortography for the Roentgen Demonstration of the Liver and Spleen, *Am. J. Roentgenol.* **72:**586-596 [Oct.] 1954). This happened to us in some cases without any danger. With a proper technique the peritoneal injection can be avoided, but if it occurs it is without danger.

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APPRAISAL OF NEW DRUGS

To the Editor:—In his letter to the Editor, in THE JOURNAL, Aug. 27, page 1547, Dr. Robert C. Batterman is not challenging Dr. Russek but is instead questioning the validity of the scientific method as applied to medicine. The use of controlled, unbiased observations is fundamental in the approach of science and cannot be summarily dismissed by the as yet unpublished observations of Dr. Batterman. If his double-blind controlled studies failed to reveal any significant therapeutic value in any one or more presumably potent drugs, as compared to placebo, it surely indicates the need for further scrutiny of the true value of these drugs under experimental and clinical conditions. Instead of being shocked into concluding that controlled experimentation is valueless, it would seem more rational for Dr. Batterman to have investigated the circumstances that produced double-blind results at variance with accepted clinical experience.

Were his subjects well chosen in terms of symptomatology? Were the circumstances of his experiments arranged adequately to simulate those of the usual patient-physician relationship? Did his experiments provide for a group of patients whose dosage schedules could be adjusted to the responses of the individual subject, while still maintaining double-blind conditions?

In studies of a similar nature we have been performing at Jackson Memorial Hospital since 1953 (data in preparation for publication), we have found that we could simulate the usual circumstances of the patient-physician relationship in the use of therapeutic agents by dividing the subjects of our double-blind study into three groups. At the time of each of a series of patient-interviews, the physician recorded his observations of clinical change, and, in accord with this evaluation, he was provided with the opportunity to advise changes in the frequency and magnitude of dosage of the therapeutic agent in question, which was being administered by injection. His specific recommendations were only carried out in subjects who happened to fall into the third or experimental group. In the first group each patient received injections of inert placebo, and in the second group they received doses that were constant in frequency and magnitude.

If this type of an experiment, performed under strict double-blind conditions, should fail to demonstrate the superiority of a presumably potent drug over inert placebo, any insistence that this drug must still have value can only be classified as cultism and a denial of the scientific method as applied to medicine.

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OUTBREAK OF HERPANGINA IN TOKYO

To the Editor:—An outbreak of herpangina occurred in Tokyo from April of this year; over 60 patients have been observed. Many of the cases occurred in several dormitories scattered in Tokyo, which include from about 40 to over 100 households, whereas about 15 cases are sporadic. The clinical picture, throat lesions, clinical course, age distribution, and other features correspond closely with those described in the United States by Zahorsky, Levine, and others; Huebner and others; Parrot and others; and Kravis and others. Clinical and etiological studies are now in progress. Attempts to isolate the causal agent in suckling mice were carried out, and almost all fecal specimens from patients tested were found to contain Coxsackie virus; each of the suckling mice inoculated with fecal specimens from patients developed the typical flaccid paralysis characteristic of Coxsackie virus infection. Those strains isolated seem to belong to group A of Coxsackie virus from the clinical symptoms manifested in suckling mice and the histological picture of infected mice (selectively in muscle). Typing of the isolated viruses has now been carried out by neutralization tests with prototype of a known type of Coxsackie virus. As yet the typing experiments are not finished; one strain, Omura, is identical with Fleetwood strain (A2), and the other one, Mitsuhashi, is identical with Kudo strain, which was recovered from a patient with paralysis in 1952 in Tokyo and is serologically not related to A1, A2, A3, and A4 but belongs to group A. Isolation tests from the healthy contacts and the demonstration of antibodies in paired patients' serums are now in progress.

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MEDICAL LITERATURE ABSTRACTS

INTERNAL MEDICINE

Treatment of Hypertension with Reserpine (Serpasil) Alone and in Combination with Hydralazine (Apresoline). L. J. Stuppy and J. N. Tober. Angiology **6**:253-259 (June) 1955 [Baltimore].

Reserpine (Serpasil), a pure crystalline alkaloid derived from the roots of Rauwolfia serpentina, was used in the treatment of 83 patients with hypertension. The group included 15 men and 68 women, and the ages varied from 34 to 80 years. All degrees of essential hypertension were represented. Two patients had previously undergone sympathectomy, and two had been treated with radioactive iodine for thyroid disease. Complications such as myocardial infarction, hypertensive encephalopathy, cerebral thrombosis, and renal insufficiency existed in some of the patients. Five of the patients also had asthmatic bronchitis, and two had aortic insufficiency with severe systolic hypertension. All were outpatients. The dosage of reserpine ranged from 0.25 to 2 mg. per day. Results appeared to be equally good whether the total daily dose was given at bedtime or in divided doses during the day. Since sufficient data had been collected on all patients prior to treatment, a placebo control series was not considered necessary. Reserpine alone did not produce adequate reduction in blood pressure in 15 of the patients. These patients were given hydralazine (Apresoline) hydrochloride in addition to the reserpine, the daily dose of reserpine ranging from 0.5 to 2 mg. and that of hydralazine hydrochloride from 50 to 800 mg. Reserpine counteracted the tendency of hydralazine hydrochloride to produce tachycardia, and the two drugs acted synergistically in reducing blood pressures. Patients received treatment for a maximum period of 12 months, and the reduction in blood pressure was satisfactory. In patients in whom tachycardia accompanied hypertension, reserpine reduced the pulse rate. Untoward reactions required discontinuation of the drug in only seven patients. Symptoms like drowsiness, looseness of stools, nasal stuffiness, or vertigo were usually so mild that the patients could continue their medication. Studies on the peripheral blood indicated no changes in the hemopoietic system.

Widened Prophylaxis of Thromboembolism with Anticoagulant Drugs in Internal Medicine. E. Scharpff and R. Seitz. Medizinische, no. 27/28, pp. 976-979 (July 9) 1955 (In German) [Stuttgart, Germany].

Between 1951 and 1954, 250 patients with venous thrombosis were admitted to the medical department of a general hospital in Hamburg, Germany, and were treated with anticoagulant drugs for an average of 25 days. Recurrences occurred in six patients soon after discontinuation of the anticoagulant therapy, but there were no recurrences in the course of the therapy. Observations on the authors' patients and reports by other workers culled from world literature suggest that involvement of the other extremity by venous thrombosis can be checked by anticoagulant therapy. Dreaded pulmonary embolism can be prevented, temperature can be restored to normal, and bedfastness can be reduced. A psychological advantage of anticoagulant therapy is the possibility of removing from the patient the fear of pulmonary embolism, a complication that up to now was known to be fatal. With the exception of pulmonary infarction with an initially fatal course, it can be considered as proved that, as a result of anticoagulant therapy, pulmonary embolism is beginning to lose its horror; its mortality has been reduced to an unexpected degree, and, in addition to the prevention of recurrences, the basic thrombotic process can be controlled. The incidence of pulmonary embolism in patients with internal diseases is higher than in surgical patients, and its diagnosis is often more difficult in patients of the first type. Widening of the indications for anticoagulant therapy of pulmonary embolism depends on an extended diagnosis. The deep-rooted belief that pulmonary embolism is an acute condition and that its criterion is sudden death is erroneous. A silent or subacute chronic course may occur in about 82% of the fatal cases. Subicterus; serous, but bilirubin-positive, pleural exudate; tachycardia refractory to digitalis; nausea; short fainting fits; shortness of breath; and slight cough may be observed frequently. Electrocardiographic changes with the phenomenon of acute cor pulmonale in the peripheral leads and acute and subacute cor pulmonale in the thoracic wall leads may be an aid to diagnosis. Certain cardiac patients with "thromboembolic constellations" may require early institution of antithrombotic measures. These constellations may be permanent or only temporary. Removal of edema by the administration of mersalyl may produce an increased viscosity of the blood and slowing of the blood stream, and decreased hepatic congestion may result in an increased tendency to thrombosis caused by an increase in the coagulation-enhancing factors. Early anticoagulant therapy directed at preventing irreversible changes of the heart muscle is indicated in disorders of the coronary vessels for which the term preinfarction (threatened infarction, acute angina pectoris) has been coined. This applies also to other diseases of the heart with a similar severe thromboembolic risk. Carefully planned institution of anticoagulant therapy instead of "treatment with anticoagulants in every case" made it possible to reduce the mortality of cardiac infarction from 41% in 1951-1952 to 16.9% in 1953-1954. Extended use of anticoagulants such as 3-(1-phenylpropyl)-4-hydroxycoumarin (Marcoumar), ethyl biscoumacetate (Tromexan), heparin, and isonicotinic acid-3-sulfonic acid neodymium in 0.7% sodium chloride solution (Thrombodym) seems to be justified by the satisfactory results obtained with these drugs in patients with venous thrombosis, pulmonary embolism, and coronary thrombosis.

Cancer of the Respiratory Tract: Recent Trends in Mortality. E. A. Lew. J. Internat. Coll. Surgeons **24**:12-27 (July) 1955 [Chicago].

Statistical data, illustrated with charts and tables, on the death rates from cancer of the respiratory tract in the general population of the United States and among industrial and ordinary policyholders of the Metropolitan Life Insurance Company indicate that during the past 25 years the white male mortality from cancer of the respiratory tract, adjusted for changes in age distribution, increased five times. An increase of this magnitude and rapidity appears greater than can be accounted for solely by better diagnosis, case finding, and reporting, especially as no other site of cancer has shown so large a proportionate increase. The increase is continuing despite the fact that the disease is now more generally recognized. Among white females, mortality from cancer of the respiratory tract, adjusted for changes in age distribution, has only doubled in the past 25 years. If all this increase were due to better detection and reporting, it would be still smaller than the increase in white male mortality. This suggests that a considerable part of the increase in white male mortality from this disease cannot be accounted for in this manner, since it is difficult to see why physicians should be able to diagnose cancer of the respiratory tract more readily in one sex than in the other. The magnitude of the increase in death rates of cancer of the respiratory tract over the past 25 years varied by age, being smallest at ages

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under 45, and greatest at the more advanced ages. The markedly higher death rates from cancer of the respiratory tract among white male industrial policyholders as compared with those for white males in the general population cannot be explained in terms of better diagnostic facilities in urban areas, since white female industrial policyholders residing in the same area showed death rates from cancer of the respiratory tract substantially the same as those for white females in the general population. The reasons for the higher death rates of white male industrial policyholders must rather be sought in some environmental factors. The lower death rates from cancer of the respiratory tract among white male ordinary policyholders, who presumably have access to even better diagnostic facilities than industrial policyholders or white males in the general population, also suggest factors related to environment, occupation, and social class. In this connection, it may be noted that several life insurance studies have indicated somewhat higher than average mortality from cancer of the respiratory tract in such numerically important occupations as painters, roofers and slaters, carpenters and cabinet makers, coppersmiths and tinsmiths, and electricians. The geographical variations in death rates from cancer of the respiratory tract in the general population likewise indicate that some environmental factors may be contributing to produce the higher death rates observed in the most urbanized and industrial states. The high age-adjusted death rates in states such as Louisiana, Florida, and Nevada also appear to require explanation in terms of special factors. There is reasonably convincing statistical evidence that a number of different factors may be implicated in the rise in the incidence of cancer of the respiratory tract. Adequate data are not available to show how much of the rise can be attributed to the effect of specific factors.

Indications and Results of Lung Needle Biopsy. M. Fazio, P. Minetto and R. Garbagni. Minerva med. **46:**1559-1567 (May 30) 1955 (In Italian) [Turin, Italy].

During the last five years the authors examined 455 patients with various conditions of the lungs. In only nine patients did they find it necessary to resort to needle biopsy to establish the diagnosis. These patients' roentgenograms had shown round shadows of the lung near the thoracic wall. Lung biopsy is particularly indicated for this topographic location. The procedure should never be used when the shadow is near the hilus or in areas in which branches of the pulmonary vessels may be injured while it is performed. Nor should it be used in patients with high fever, heart disease associated with stasis of the pulmonary circulation, cardiovascular collapse, recent hemoptysis, the coexistence of bronchopneumonic foci, or the presence of progressive tuberculous lesions or in patients in whom an aneurysm or an Echinococcus cyst is suspected. Eleven lung biopsies were performed on the nine patients. It was possible to establish a diagnosis of primary malignant neoplasm in five, bronchial cyst in one, sequelae of pleurisy in two, and pleural mesothelioma in one. A mild subcutaneous emphysema in the area surrounding the site of the puncture was observed in one patient, a transitory onset of capillary bleeding in two, and a moderate hemorrhage followed immediately by the excretion of purulent matter (evidence that the bronchial drainage had been restored) in one. The authors conclude that lung needle biopsy can be a decisive diagnostic means in peripheral lesions of the lung and the technique of choice in cases in which a diagnosis cannot be reached by the standard means.

Results of Scalene Node Biopsy in Patients with Pulmonary Calcifications. J. E. Johnson Jr. Am. Rev. Tuberc. **72:**91-97 (July) 1955 [New York].

The author performed scalene lymph node biopsy in 50 consecutive male Air Force recruits with pulmonary calcification. The men were also subjected to clinical study and were skin tested with histoplasmin, coccidioidin solution, and purified protein derivative. The place of residence of the recruits and the results of the skin tests indicated that the majority of these calcifications were probably of histoplasmic origin. In five recruits the scalene node biopsy revealed pathological material. From one scalene node a virulent culture of Histoplasma capsulatum was obtained. Two nodes were histologically consistent with sarcoidosis; these nodes were not cultured for histoplasmin. Two nodes showed a nonspecific inflammatory change. Because of the difficulty in prognostic interpretation of results in the relatively small number of cases with abnormal scalene node findings, the author feels that the procedure is not economical for routine evaluation of patients with pulmonary calcifications. It should prove to be a useful procedure when clinically indicated for diagnostic purposes and for further study of histoplasmic infection.

SURGERY

Case of Acromegaly Associated with Thyrotoxicosis: Review of Literature. J. P. Heaney, C. L. James, C. L. Spurr and M. E. De Bakey. A. M. A. Arch. Surg. **71:**279-287 (Aug.) 1955 [Chicago].

In acromegaly, thyromegaly and thyrotoxicosis often coexist to complicate the therapeutic problems as well as the prognosis of the pituitary disorder. Moreover, the clinical picture of disease of these two endocrine organs may be additionally confused by the simultaneous dysfunction of other endocrine glands, notably the pancreatic islet cells. The 29-year-old man whose case is presented was hospitalized in September, 1949. He had first noted enlargement of chest, hands, and feet in 1943. During 1948 headaches, polydipsia, polyphagia, and polyuria developed. In February, 1949, he became sexually impotent. At about the same time he noticed enlargement of the neck, hoarseness, mild dysphagia, and hacking cough. For six months prior to admission he had been troubled by increased intolerance to heat, with excessive sweating, muscular weakness, fatigue, cardiac palpitation, and dyspnea on exertion. He had lost a moderate amount of weight in spite of an increase in appetite. Physical examination revealed the prognathism and enlargement of the hands and feet characteristic of acromegaly. The supraorbital ridge was prominent, and exophthalmos was moderately advanced. The tongue was large. The thyroid was considerably enlarged and nodular. Roentgen-ray therapy to the pituitary was recommended in September, 1949; however, it was decided that the thyrotoxicosis should be treated by a thyroid-blocking agent, and administration of propylthiouracil was begun. The dosage was approximately 200 mg. three times daily. Because of lack of response to the thyroid-blocking agent and because of development of severe exfoliative dermatitis, propylthiouracil therapy was discontinued on Nov. 26, 1949. Administration of strong iodine (Lugol's) solution and roentgen-ray therapy to the pituitary were started at once. The patient's condition was so grave that it was no longer possible to rely upon a single agent. Roentgen-ray therapy was given through three 5 cm. ports, one anterior and two temporal; 2800 r were delivered to each. The patient's condition improved. On Jan. 3, 1950, total thyroidectomy was done. The postoperative course was uneventful. In March, 1954, the patient's condition was still satisfactory. Literature reports support the contention that the hypermetabolism of acromegaly is due not only to possible associated thyrotoxicosis but also to some direct action of the pituitary gland. Various forms of treatment have been used for both the acromegaly and complicating hypermetabolism. In the absence of hazardous pressure symptoms from either the pituitary tumor or the thyromegaly, initial therapy should consist in external irradiation of the pituitary gland. If adequate radiation therapy fails to control the hypermetabolism, total thyroidectomy should be performed after the patient has been prepared with strong iodine solution. Acromegalic patients with laryngomegaly are more likely to need temporary tracheotomy after thyroidectomy than other patients, even in the absence of recurrent laryngeal nerve injury. The presumed fear of progression of acromegaly after thyroidectomy seems unjustified.

Results of Thoracolumbar Sympathectomy for Essential Hypertension: Three-to-Seven-Year Follow-Up of One Hundred Patients. H. A. Zintel, J. A. Mackie, A. M. Sellers and others. A. M. A. Arch. Surg. **71:**215-222 (Aug.) 1955 [Chicago].

Seven years ago the authors subjected a number of patients to thoracolumbar sympathectomy and followed these patients closely. At the present time 100 patients have been followed

for from three to seven years, with an average postoperative follow-up of five years and two months. Surgical treatment was employed for the following reasons: (1) because the patients had severe forms of the disease, generally a diastolic blood pressure of more than 120 mm. Hg; (2) because they did not do well on other types of therapy and principally because they showed evidence of progressive vascular damage; and (3) because their status indicated a very poor prognosis. Surgical treatment was refused to patients with azotemia, to those who had had a coronary occlusion or a cerebrovascular accident within three months, and to those who had permanent severe cerebral damage, although 19 of the patients operated on had had strokes and there were 9 others who had had previous cerebral vascular accidents with residual neurological signs at the time of operation. The preoperative status of the patients is recorded in regard to symptoms, retinopathy, cardiac abnormalities, phenolsulfonphthalein excretion, serum blood urea nitrogen levels, average normal urea clearances, and Smithwick grouping. The operative procedure used was slightly more extensive than the procedure described by Smithwick. It is not possible to state whether the better survival rates observed were due to the more extensive resection. The data reported here would indicate that group 4 and 5 patients as well as group 1, 2, and 3 patients are suitable candidates for operation, because the average five year survival rate of group 4 and 5 patients is more than 50%. This is considerably better than the five year survival rate for group 4 and 5 patients not treated surgically. Two operative deaths resulted in the 100 patients. Eighty-five per cent of the living patients consider themselves improved.

Extension of Radical Mastectomy to Include the Internal Mammary Lymph Node Chain. J. A. Urban. West. J. Surg. **63:**463-469 (July) 1955 [Portland, Ore.].

The classical radical mastectomy has so far produced the best therapeutic results in cancer of the breast. The author feels that further improvement will be obtained primarily through earlier diagnosis and through early, more radical surgical treatment. The most logical extension of the radical mastectomy procedure is the inclusion of the en bloc resection of the internal mammary node chain, since breast cancer drains primarily into two main lymph node systems, the axillary and the internal mammary chain. A practical technique has been worked out, in which the internal mammary chain is removed en bloc in continuity with the breast, pectoralis muscles, and axillary contents. Closure and stabilization of the defect in the chest wall has been accomplished with a free fascia lata graft. So far this operation has been carried out on 160 patients with only one postoperative death. The internal mammary node chain was found to contain cancer tissue in 36% of the first 150 patients, while the axillary nodes were found to contain cancer tissue in 54% of the patients. Thirteen per cent of the women in whom the axillary nodes were free from cancer were found to have cancer tissue in the median chain of nodes. The author operated chiefly on patients with inner quadrant breast lesions, since these show a greater incidence of metastases in the internal chain of lymph nodes. Early results of this operation have been encouraging. The author feels that this operation is especially indicated for stage 1 and early stage 2 lesions, particularly when the breast lesion presents below the nipple or in the medial portion of the breast. He does not believe that this more radical procedure can save the patient with advanced breast cancer.

Results of Surgical Treatment of Lung Cancer. M. Bérard, E. C. Saubier and G. Maret. Lyon chir. **50:**534-546 (July) 1955 (In French) [Paris, France].

A statistical study was made of 131 patients with pulmonary cancer treated surgically between January, 1948, and November, 1954. Among the first 53 excisions there was a mortality of 15 (28%), while among the last 55 (performed after 1951) there were only 4 deaths (7%). The remaining 23 patients had exploratory thoracotomies only. The basic difference between the first and second operative series lies in the anesthetic technique used. In the first series, deep anesthesia under controlled respiration was the cause of several deaths during operation or immediately afterward. In the later series, the light anesthesia used caused no complications, and all the deaths can be attributed to operative accidents. Despite the high proportion of early recurrences of small-cell carcinoma, some significant results were obtained, namely, three five year survivals, one four year survival, and four three year survivals. Of the 108 excisions, 95 were pneumonectomies and 13 were lobectomies. It is logical to perform a lobectomy in any patient in whom the anatomic features of his disease permit and especially in elderly patients, more particularly if they are operated on the right side. The inoperability of a cancer with opened thorax cannot be judged until after the pericardium has been opened. Following this rule, the authors obtained surgically good results in more than 80% of their last 50 patients who underwent thoracotomy. When total excision has been decided on, the so-called expanded pneumonectomy should be used.

Extrapleural Pneumothorax and Thoracoplasty in Extreme and in Hyperchronic Cases. A. Rabino, F. Sacco and A. Gaida. Minerva med. **46:**1660-1663 (June 6) 1955 (In Italian) [Turin, Italy].

A comparison between interventions of extrapleural pneumothorax and thoracoplasty performed in patients with severe cases of tuberculosis before and after 1948 indicated that 30% of these operations were performed before as compared with 55% after that year. The antibiotics have made it possible to operate on patients with severe lesions who could not have been subjected to surgery in the preantibiotic era. Of 242 patients operated on by the authors during the last few years, 128 were severe or highly chronic cases. Of these, 46 were improved; the results were good in 58 and poor in 20; and 4 patients died. The rate of complete recoveries was 45% in the advanced cases as compared with 87% in the other cases in which these interventions were performed. Extrapleural pneumothorax gave good results in 64% of the cases whereas with thoracoplasty the results were good in 42% only. A greater number of residual cavities is observed after thoracoplasty. The authors conclude that extrapleural pneumothorax should be preferred to thoracoplasty when operating on patients with severe cases of tuberculosis because it is more useful and less dangerous.

Chondromatous Hamartoma and Pure Chondroma of Lung. I. Novi. Arch. ital. chir. **79:**315-336 (No. 4) 1955 (In Italian) [Bologna, Italy].

Three cases of benign cartilaginous formations in the lung are reported. The mass in two patients was endobronchial and was removed by lobectomy. The microscopic structure was typical of a chondromatous hamartoma. The third case was discovered at autopsy in the victim of a traffic accident. The mass was found within the lung parenchyma, and histological studies revealed that the structure consisted exclusively of cartilaginous tissue. The author considered this a pure chondroma of the lung, which he defines as a true neoplasm arising from the preexisting bronchial cartilages. Less than 200 cases of chondromatous formations in the lung have been reported in the world literature. The condition, which is more common in male patients, is found mostly in the lower lobes, often in the central areas, and less frequently in the peripheral areas in close contact with the pleura. In rare instances, these formations, which are generally of a hard, stony, and rubbery consistency, are in direct relationship with a bronchus. Sometimes they develop within a bronchus and are seen in the lumen in the form of a polyp. The microscopic structure is composed of mesodermal, epithelial, and, sometimes, fat elements in a well-defined and uniform architectural pattern. In some instances, only cartilaginous tissue—normal or metaplastic—is present (pure chondroma). Symptoms, except for instances in which the mass is extremely large or in direct relationship with a bronchus, are of little diagnostic help. In instances in which the mass lies within the lung parenchyma, differential diagnosis should be made from hydatid cysts and tuberculomas. The intrapulmonary forms can often be enucleated quite easily; when they cannot, lobectomy and, sometimes, pneumonectomy give excellent results. The clinical, roentgenologic, and bronchoscopic findings of endobronchial chondromatous formations are similar to those of bronchial adenoma. These masses can be removed by endoscopy or bron-

chotomy only if the diagnosis has been confirmed by biopsy; otherwise pulmonary resection is required. A definite preoperative diagnosis of these formations is impossible most of the time.

NEUROLOGY & PSYCHIATRY

Hereditary Combined Neurinomas and Meningiomas. L. M. Davidoff and J. Martin. J. Neurosurg. **12:**375-384 (July) 1955 [Springfield, Ill.].

Von Recklinghausen's disease in the form of multiple neurofibromatosis affecting not only peripheral nerves but cranial and spinal nerve roots has been demonstrated to show marked hereditary tendencies. Even when this disease, unaccompanied by widespread neurinomatosis, manifests itself only in the form of bilateral acoustic nerve tumors, it has been shown to be hereditary. Cushing and Eisenhardt, in their monograph on meningiomas, brought together from the literature reports of cases of multiple meningiomas and of neurinomas and meningiomas occurring in the same patient. The earlier history of one of the two patients cited here had been reported by Cushing. This patient was the father in the father and daughter team presented here. The patients had bilateral cerebellopontine neurinomas combined with meningiomatosis. Bilateral deafness was present in both patients; bilateral acoustic neurinomas were suspected in each. In the father a small tumor nodule in one cerebellopontine angle was found that, in addition to typical whorl formations, also showed areas of palisading suggesting a mixed type of tumor. The rest of his many small and large intracranial neoplasms were typical meningiomas. No postmortem examination was performed in the father. In the daughter a meningioma was removed from the thoracic spinal canal at the age of 15, and at 20 multiple posterior fossa meningiomas were verified at operation. At postmortem examination the undersurface of the dura mater bilaterally was studded with discrete as well as confluent almost countless meningiomas, in addition to which two larger tumors, one in each cerebellopontine angle, were found that histologically were neurinomas but contained whorls in areas suggestive of mixed neurinoma and meningioma in the same tumor, similar to the angle tumor reported in her father.

Electroencephalographic Changes in Antabuse Treatment. E. Pedersen. Ugesk. læger **117:**812-816 (June 23) 1955 (In Danish) [Copenhagen, Denmark].

More extensive use of electroencephalography before the start of Antabuse treatment and during the first weeks of the treatment is thought desirable. Investigations showed that in most cases changes in the electroencephalogram occur during treatment with 0.5 gm. Antabuse daily, both in normal persons and in chronic alcoholics. The changes are manifested by lower dominant rhythm and increased occurrence of low frequencies with increased and varied voltage, so that the curves often present a paroxysmal pattern. In some cases spikes appear and sometimes there are focal changes. The electroencephalographic changes appear to be independent of whether the curves were normal or abnormal before Antabuse treatment and are an expression of the toxic effect on the cerebrum, probably involving both the basal ganglions and cortex. The changes were least marked when low doses were given. The doses should be individualized and probably be set as low as possible. Permanent changes in the electroencephalogram in some cases may point to permanent organic injury. Antabuse lowers the convulsive threshold, as evidenced partly by the occurrence of spontaneous seizures and partly by the fact that in two cases, one of them in a normal person, signs of epileptic seizures occurred on provocation. Caution is urged in treating epileptics with Antabuse.

Epilepsia Tarda: Clinical Analysis. R. Müller. Nord. med. **53:** 990-994 (June 23) 1955 (In Swedish) [Stockholm, Sweden].

From 1951 to 1953, 126 patients with epileptic seizures setting in after the age of 30 were treated in the Serafimer Hospital. The neurological status was negative. Neither history nor psychic or physiological examination gave reliable information as to the etiology of the attacks. The cerebrospinal fluid was normal except in one case. In 65 patients the seizures were focal type-generalized seizures with aura, psychomotor seizures, or jacksonian convulsions. Cerebral tumor was established in 14 cases and in three additional cases roentgenologic changes pointed to an expansive process. One of the verified tumors gave no roentgenologic changes; electroencephalographic changes and the clinical picture led to operation. Three patients had aneurysms. Of the 18 patients with jacksonian convulsions, 10 had a tumor or aneurysm. Electroencephalography was done repeatedly in all but 4 cases; focal changes were demonstrated in 38 cases and uncertain in 3, and epileptogenic activity was found in 17 cases. Pneumoencephalography was done in all but the 3 cases in which arteriography had revealed an aneurysm, and carotid angiography was performed in 84 cases, bilaterally in 31 of these. Fifteen of the 16 patients in whom roentgenogram showed an expansive process were operated on, and tumor was verified in 13 cases. Of 20 patients with grand mal only 3 had a tumor. In meningioma clinical analysis was more reliable than electroencephalography. Besides the expansive processes, angiopathy and trauma were the most common causes of late epilepsy. Cerebral angiopathy is difficult to establish and the diagnosis is most often a probability diagnosis.

Treatment of Tuberculous Meningitis with Particular Reference to the Intrathecal Tuberculin Reaction. H. M. Rennie and J. Read. Australasian Ann. Med. **4:**135-140 (May) 1955 [Sydney, Australia].

Rennie and Read describe observations on two patients with tuberculous meningitis, with particular regard to the treatment and the intrathecal tuberculin reaction. They feel that the accumulated evidence favors the abandonment of intrathecal therapy, and they now use the following therapeutic regime for adults: (1) streptomycin, given by intramuscular injection in a dose of 2 gm. per day until a definite response is established, followed by 1 gm. per day for 6 months and 1 gm. twice a week for at least another 6 months; (2) isoniazid, 300 mg. given orally per day for at least 12 months; and (3) corticotropin or cortisone, if any evidence of subarachnoid block appears. The first of their two patients, who was in a very early phase, made an uncomplicated recovery. The second patient had a longer history when she came under treatment, and though her cerebrospinal fluid findings improved slowly, she was still ill and had evidence of increased intracranial tension and commencing subarachnoid block after six weeks of treatment. In view of these findings, it was suggested by a neurological consultant that the intrathecal administration of streptomycin be given a trial. However, she became so much worse under this treatment that it was hurriedly abandoned. Corticotropin and cortisone completely reversed the ill-effects, and her clinical condition improved rapidly. Since that time her progress has been one of steady improvement. With regard to the behavior of the cerebrospinal fluid, the authors point out that Smith and Vollum in 1950 drew attention to the fact that with a regime of intrathecal and intramuscular administration of streptomycin high "spikes" of cells, containing 60% to 90% of polymorphonuclear cells, appeared in the cerebrospinal fluid at about the time when the organisms were disappearing from the cerebrospinal fluid. This common finding was considered to be associated with a chemical irritation of the meninges by the intrathecal administration of streptomycin. However, Swithinbank, Smith, and Vollum found that streptomycin injected into the normal subarachnoid space does not cause any noticeable cellular reaction. On the other hand, by the introduction of tuberculin into the subarachnoid space of Mantoux-positive control patients, they were able to reproduce the spikes of cells, with polymorphonuclear predominance, and a rise in protein content very similar to that seen in tuberculous meningitis treated by the intrathecal administration of streptomycin. They then regarded the cerebrospinal fluid pleocytosis in tuberculous meningitis as due to an endogenous tuberculin reaction set off by the tuberculoprotein of organisms killed by intrathecally administered streptomycin and not to the irritant effect of streptomycin itself. The authors regard the cerebrospinal fluid response in their own cases as a natural endogenous intrathecal tuberculin reaction, the more so since intrathecal streptomycin therapy was not used in one of their patients and only briefly in the second patient. They emphasize the apparent suppressive effect of corticotropin and cortisone.

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PEDIATRICS

Studies in Sickle Cell Anemia: V. Sickle Cell Hemoglobin C Disease (Report of Two Cases in Siblings with Clinical and Genetic Observations and a Brief Review of the Literature). R. B. Scott and M. E. Jenkins. A. M. A. Am. J. Dis. Child. **90:**35-42 (July) 1955 [Chicago].

The application of genetic, biochemical, and electrophoretic techniques to the study of sickle cell anemia has revealed that the condition is not a simple disease entity but is in reality a hemolytic syndrome that may be separated into specific subtypes depending upon the variety of abnormal hemoglobin present. The designation of sickle cell anemia is reserved for the type in which the genes responsible for sickling are homozygous. Statistically, this is the commonest variety. The second most frequently encountered type of sickle cell disease in American Negroes is apparently sickle cell–hemoglobin C disease and is due to the simultaneous presence in the person of the sickle cell gene and the gene responsible for C hemoglobin. The authors present observations on two siblings with sickle cell–hemoglobin C disease. The patients were Negro boys, aged 12 and 9 years respectively. The mother of these boys carries the sickle cell trait and the father carries the trait of C hemoglobin. One paternal uncle shows C trait, as does one of his three sons. Both boys had symptoms fairly early but have experienced a very mild course. The clinical picture of mild hemolytic anemia, infrequent pains, enlarged spleen, and numerous target cells on peripheral smear in a Negro patient whose blood exhibits the sickling phenomenon should immediately suggest the possibility of sickle cell–hemoglobin C disease. The diagnosis can easily be confirmed by paper electrophoresis. The disease is inherited in the same manner as the commoner homozygous sickle cell disease, with one parent contributing the sickling trait, the other the trait of hemoglobin C. In general, this subtype is milder than the commoner variety; however, cases of exceptional severity have been reported. Awareness of this new hemolytic syndrome is necessary in order to avoid confusion with similar entities. The first patient was thought to have the usual type of sickle cell anemia from the age of 5 to 12 years. The second patient had been considered a sickle cell trait case. Some of the thalassemia-minor-like cases observed in the Negro may represent hemoglobin C trait states (combination of normal and C hemoglobins). The benign hemoglobin C trait has been found to occur in about 2% to 3% of American Negroes. The blood smear may appear normal except for the presence of target cells. Sickle cell–hemoglobin C disease has a fairly characteristic clinical picture, namely, relatively mild crises, erythrocyte sickling, and high incidence of target cells on blood smears associated with an enlarged spleen. A definitive diagnosis can be made by the use of filter paper electrophoresis. Treatment is mostly symptomatic, and blood transfusions are rarely necessary.

Acute and Subacute Terminal Ileitis. Chérigié, Tavernier, Dupas and Raynal. Semaine hôp. Paris **31:**2417-2427 (July 6) 1955 (In French) [Paris, France].

The authors performed radiographic examinations of the terminal ileum in 70 children in the active or convalescent stage of various diseases. They concluded that follicular hypertrophy is rare in normal children and that lymphoid hypertrophy of the terminal ileum should be considered a pathological manifestation. Ileocecal localization seems to reflect a primary disease; the authors found that most of their patients with infectious diseases (measles, scarlet fever, angina, or pneumonia) or parasitoses had considerable follicular hypertrophy with enlargement of the aggregate nodules and adenopathy sometimes visible roentgenologically. Many of the patients had a point of tenderness or pain over the appendix; this pseudoappendicitis so often seen before the appearance of an infectious disease is explained by the frequency of the lymphoid hypertrophy. Other diseases that are preceded or accompanied by hypertrophy are tuberculosis of the small intestine, regional ileitis (Crohn's disease), and typhoid. The authors believe that so-called primary mesenteric adenitis and common inflammatory follicular hypertrophy are in reality the same disease. Hypertrophy of the lymph nodes is common to both. The disease appears to be more severe in adults than in children. The differential diagnosis from Crohn's disease is almost impossible at the outset. During epidemics of infectious diseases, radiological examination should be made of patients with appendical pain in order to demonstrate the presence or absence of mesenteric adenitis so that unnecessary surgical intervention may be avoided.

Treatment of the Nephrotic Syndrome with Corticotropin (ACTH) and Cortisone: A Four-and-One-Half-Year Survey of Results with Short-Term Courses. W. Heymann, S. Spector, L. W. Matthews and D. J. Shapiro. A. M. A. Am. J. Dis. Child. **90:**22-27 (July) 1955 [Chicago].

Sixty-four children with the nephrotic syndrome, whose ages ranged between 1 and 9 years, were observed by the authors between October, 1949, and April, 1954. The shortest period any child has been followed has been 14 months, and more than 50 have been followed for more than two years. Corticotropin was given by the intramuscular route in four divided doses in amounts of 60 to 80 units per 24 hours, usually for 10 to 12 days. When given intravenously, 15 units were given in 300 ml. of 5% dextrose by slow drip over 8 to 12 hour periods. Cortisone was used orally in doses of 150 to 200 mg. per 24 hours in three divided daily doses for 10 to 12 days. When diuresis occurred or if it failed to be noted by the eighth or ninth day, the dosage of the hormones was gradually reduced over a three to four day period. The 64 children received a total of 189 short-term courses of corticotropin or cortisone. Twelve are probably cured, 19 are in remission, in 16 the disease is still active, and 17 are dead. Diuresis was obtained in 81%. The incidence of diuresis did not significantly differ whether corticotropin was given by intramuscular or by intravenous injection or whether cortisone was used. The average length of remission after corticotropin therapy was 4.2 months and after cortisone, 2.6 months. The incidence of diuresis in patients who ultimately died in renal failure was 53%. Of 13 patients who failed to have diuresis two or more times, 11 have died in uremia. Complications such as azotemia and electrolyte disturbances were infrequent and reversible. Convulsions occurred six times during the period of therapy and were a sign of poor prognosis. Of 17 children who died, at least 14 died in renal failure. Ten of these had no hematuria, azotemia, or hypertension at the time of onset of treatment. This observation suggests that corticotropin or cortisone given in short-term courses does not affect the progression of the glomerular lesion. An ultimate mortality rate of approximately 35% is expected in this series.

A Study of Twins: Blood Groups and Other Data. R. J. Walsh and O. Kooptzoff. Australian J. Exper. Biol. & M. Sc. **33:**189-198 (April) 1955 [Adelaide, Australia].

The primary purpose of the present work was to investigate the usefulness of blood groups in distinguishing uniovular from binovular twins. The opportunity was taken to compare differences in weights and lengths of the pairs according to the results of blood grouping, and maternal age and parity were also compared in the two groups. Blood samples were obtained from all twins delivered at the Royal Hospital for Women, Sydney, and at the King George V Memorial Hospital for Mothers and Babies, Sydney. Two or three drops of blood were obtained from a needle prick of the heel and mixed with approximately 1.5 ml. of physiological sodium chloride solution. The red blood cells were washed twice with this solution before use and were tested within 24 hours of collection. Tests were performed on every sample for the A_1A_2BO groups, the MNS system, and with anti-D, anti-C, anti-E, and anti-c of the Rh system. Tests were usually made for the Fy (a) antigen and on some occasions for the P, Le(a), Lu(a), and Kell antigens. However, only the results of the ABO, MNS, and Rh tests are considered in this paper. At the time of the blood groups test, the authors were not aware of the sex of the twins nor of their weight and length. This information, together with details of the maternal age and parity, was obtained later from the hospital records. Each of four factors (sex, ABO group, Rh group, and MNS group) distinguished a number of binovular twins, and each factor had approximately the same value. On the average, a single factor

distinguished 34% of the pairs examined. Six different combinations of any two of these factors can be obtained, distinguishing on an average 53% of the pairs. The four combinations of three factors distinguish on an average 64%, while all four factors together distinguish 70%. The percentage of binovular pairs established (1) by sex alone was 30%; (2) by sex and ABO group was 54%; (3) by sex, ABO group, and Rh group was 65%; and (4) by sex, ABO group, Rh group, and MNS group was 72%. From theoretical considerations, it seems probable that the four factors used together distinguish almost all the binovular pairs. Determination of the ovular origin of human twins may be important in studying the susceptibility of genetically similar individuals to physical disorders and to psychotic and neurotic disturbances. In childhood and adult life, physical differences frequently permit recognition of the binovular nature of twins of the same sex, but such differences are usually not apparent in the neonatal period. Furthermore, the anatomy of placentas is sometimes difficult to interpret and is not always decisive.

OPHTHALMOLOGY

Retrolental Fibroplasia in the United Kingdom: A Report to the Medical Research Council by Their Conference on Retrolental Fibroplasia. Brit. M. J. **2:**78-82 (July 9) 1955 [London, England].

In October, 1951, when very little was known of the etiology and incidence of retrolental fibroplasia, a detailed investigation was set in train by the Medical Research Council. Premature baby units in hospitals spread throughout the United Kingdom were asked to complete a questionnaire relating to each mother during her pregnancy and to the treatment and development of the baby up to the age of 6 months. Observations were recorded at 17 such units during the period Oct. 1, 1951, to May 31, 1953. During the 20 months of the inquiry, 1,999 babies of 4 lb. (1,800 gm.) or under entered the nurseries, and the 1,095 of them who survived for at least two months form the basis of this report. Of these 1,095 babies, 84 (7.7%) showed evidence of a retinopathy, the criterion being the presence of neovascularization in the fundus, which was found during routine ophthalmoscopy performed at regular intervals on all the children. In 39 of the 84 infants there was a subsequent regression, or return to normal fundi; in 45 there was blindness, implying one or both eyes permanently affected, with almost certain severe loss of vision. It was found that the cause of prematurity and maternal factors other than vaginal bleeding did not influence the subsequent development of the retinopathy. Boys were more often affected than girls; the main reason for this appears to be that they are more immature than girls for a given birth weight. The nurseries showed wide variations in their use of oxygen and, in general, corresponding variations in the incidence of the disease. The use of oxygen predisposed to the development of a retinopathy. Except in two cases, at least five days' treatment with oxygen was required to produce the disease; and the likelihood of a baby getting the disease increased as the treatment with oxygen was prolonged. There are many other variables to be taken into account, but nurseries in which little oxygen was given and which were free from cases of progressive retinopathy did not, on the average, experience survival rates inferior to nurseries using more oxygen. Clinical signs of anoxia at and after birth were associated with a higher incidence of retinopathy, but on the average more oxygen was given to anoxic babies.

Incidence of Retrolental Fibroplasia in England and Wales in 1951. J. T. Boyd and K. M. Hirst. Brit. M. J. **2:**83-85 (July 9) 1955 [London, England].

Particulars were obtained from all local authorities in England and Wales of infants born in 1951 having a birth weight of 4 lb. 6 oz. (2,000 gm.) or less and surviving at least two months. The survey provided data on 6,926 infants. The condition of the eyes was ascertained and 127, or 1.83%, of the infants were found to have retrolental fibroplasia. Not a single case of retrolental fibroplasia was found among the 797 infants who were born at home and remained there. This absence of cases among the home infants supports the view that the risk of developing retrolental fibroplasia is closely associated with some factor connected with hospitalization. Applying the specific incidence rates by sex and birth weight observed in the total population of infants to the number of infants in each of the corresponding subgroups of the home population, it was found that as many as seven or eight cases would have occurred among the infants born at home and not transferred to hospital, if they had been subject to the same risks as the whole population. The incidence of retrolental fibroplasia was closely related to birth weight, declining steeply with increasing birth weight. The incidence was higher in males than in females, but this difference may be due to male babies being less mature than female babies of the same weight. Twin babies showed the same incidence as single babies. Considerable regional variability was observed.

Retrolental Fibroplasia: Three Cases in Puerto Rico. G. Pico. Bol. asoc. méd. Puerto Rico **47:**288-296 (July) 1955 (In Spanish) [Santurce, P. R.].

Retrolental fibroplasia is the most frequent cause of blindness among infants of certain countries in which the care of premature infants includes prolonged exposure of the infant to oxygen at high concentrations in incubators. The disease develops in 98% of premature infants, weighing approximately 4 lb. (1,800 gm.) at birth and in 2% of infants having normal weight at birth. Usually the disease is bilateral but may be unilateral. The eyes appear normal immediately after birth. Constriction of the retinal vessels may or may not appear in the first three weeks of life of the infant. The disease follows its course in an active period of three months followed by the cicatricial period. The early retinal changes are first clinically noted about the end of the third week. They consist of dilatation and tortuosity of the retinal vessels, edema, hemorrhages, elevation of the retina, and new blood vessel formation, followed by some other changes up to complete detachment of the retina and diffusion of angioblastosis. After this period, permanent damage manifests itself by the presence of opaque masses of detached retina and vascularized fibrous tissue behind the lens. The differential diagnosis is made from retinoblastoma, persistent primary hyperplasia of the vitreous and pseudoglioma, so-called metastatic retinitis, or purulent endophthalmitis. The disease may appear in infants born at full term who did not have oxygen therapy. In these infants, the sudden increase of oxygen from 50% in the arterial blood of the fetus to 90% at birth plus a retinal lability seem to be the cause of the disease, whether the infants are premature or full-term. No cases of retrolental fibroplasia have been reported from Latin American countries and from Puerto Rico, all countries in which incubators are few and the infants are rarely exposed to high concentrations of oxygen. The author reports three cases in Puerto Rican children whom he observed in the course of the last 10 years in the Clinic of Ophthalmology of the University of Puerto Rico. Two of the patients are prematures and one was born at full term and with normal weight. None of the patients received oxygen therapy in the neonatal period. The children are blind with the typical damage of retrolental fibroplasia.

Intermittent Exophthalmos from Orbital Varices. J. A. Sená. Semana méd. **62:**805-810 (June 9) 1955 (In Spanish) [Buenos Aires, Argentina].

The subject of this report, a man 24 years old, was normal up to the age of 20, when he began to notice transient exophthalmos of the left eye following any violent movement of the head or physical effort. Exophthalmos disappeared on discontinuation of the effort. The eye was enophthalmic in normal conditions. Acute bending of the patient's head produced exophthalmos of 20 mm. in the left eye, whereas the right eye did not change. The condition disappeared as soon as the head was turned to the normal posture. There was no ocular pain, dilatation of the facial veins, cutaneous or intracranial varices, or supernumerary rib. The eyes and vision were normal. The author states that intermittent exophthalmos is always unilateral

and nearly always on the left side (90% of the cases). The condition follows a benign course when orbital varices are uncomplicated. Prophylactic treatment consists of preventing postural changes and physical efforts. Progression of the condition, as shown by recurrences and progressive degree of exophthalmos or ocular pain, calls for medical therapy consisting of perivascular intraorbital injections of sclerosing substances to cause obliterating periphlebitis of the varices. For this purpose, Raverdino's method and technique are of value. During the occurrence of provoked exophthalmos a 4 cm. needle is introduced into the lower wall of the orbit and a perivascular injection of 2 cc. of a solution containing quinine hydrochloride, 4 gm., urethan, 2 gm., and distilled water, 30 cc., is given. The injection is followed by a transient acute pain in the orbit and an acute inflammation of the involved half of the face. This is controlled in two days by application of cold compresses. One injection is sufficient; if it is necessary to administer a second injection, it can be given one week after the first.

THERAPEUTICS

Antiarrhythmic Action of Ambonestyl. V. Lanzoni and B. B. Clark. Circulation Res. **3:**335-343 (July) 1955 [New York].

The antiarrhythmic activity of Ambonestyl, 2-diethyl-aminoethyl-isonicotinamide (MC 4112), was compared with that of procaine amide in a series of experiments on dogs. Ambonestyl was shown to be as effective in suppressing experimental ventricular tachycardia following coronary occlusion as procaine amide; pharmacologically, however, it is more specific because (1) it does not depress cardiac conduction, (2) it does not elevate the ventricular electrical threshold, and (3) it produces less hypotension. This last finding is clinically interesting, because the frequency with which procaine amide produces hypotension when administered intravenously limits its usefulness. Comparison of the relative arrhythmia-suppressive potency of the two products indicated that the activity of Ambonestyl was roughly equivalent (on a weight basis) to that of procaine amide; the duration of its action, on the other hand, seemed to be longer. The over-all toxicity of Ambonestyl is less than that of procaine amide. The fact that cardiac conduction is not depressed by Ambonestyl is important, because depression of conduction may occur with the use of both procaine amide and quinidine, especially in patients with intraventricular conduction disturbances. A slight increase in the refractory period following the administration of Ambonestyl was the only effect demonstrated on normal heart tissue. These findings suggest that neither elevation of the ventricular electrical threshold nor depression of cardiac conduction is essential to antiarrhythmic action. Examination of Ambonestyl for other pharmacological actions revealed that it has no local anesthetic, no adrenolytic or sympatholytic, no atropine-like, and no antihistaminic activity. Vagal depressing and ganglionic blocking actions were evident only with large doses (about three times those of procaine amide). Preliminary studies in man, now in process of publication, have so far corroborated these experimental findings.

Effectiveness of Aramine in the Treatment of Shock. J. H. Moyer and H. L. Beazley. Am. Heart J. **50:**136-144 (July) 1955 [St. Louis].

Vasopressor agents have proved of value as collateral therapy in shock, not only because they help to restore the blood pressure but because some of these agents have proved effective in improving depressed renal function. Levo-1-(M-hydroxyphenyl)-2-amino-1-propanol, which is known as Aramine, is a synthetic sympathomimetic amine. It has a more prolonged effect than arterenol (norepinephrine). Twenty patients with various types of clinical shock were given Aramine by constant intravenous infusion. The concentration varied from 50 to 200 mg. per liter, depending upon the pressor response. The rate of infusion was varied (between 2 and 6 cc. per minute) as necessary in order to avoid excessive fluid administration. In 4 of the 20 patients, arterenol in concentrations varying from 4 to 16 mg. per liter was used in combination with Aramine in an attempt to maintain a constant blood pressure without administering large amounts of fluid. The other patients were treated alternately with Aramine and arterenol (for shorter periods of time) for comparative purposes. Renal hemodynamic studies were done on several patients using inulin to determine glomerular filtration rate and *p*-aminohippurate to determine renal plasma flow. The patients included 14 men and 6 women, who ranged in age from 23 to 93 years. Shock was due to acute myocardial infarction in three patients, cerebrovascular accident in four, upper gastrointestinal hemorrhage in one, bleeding esophageal varices in two, serum sickness in one, postpartum hemorrhage in one, uremia in three, Weil's disease in one, sickle cell crisis in one, carcinomatosis in two, and anesthesia induction in one. Six of the patients received whole blood transfusions in varying amounts prior to the vasopressor administration. It is believed that these patients probably would have died had not vasopressor therapy been available. Nineteen of the patients had a prompt and satisfactory vasopressor response within 8 to 10 minutes. The unresponsive patient was admitted in shock of approximately two and one-half hours' duration. Despite rapid intravenous administration of Aramine there was no significant blood pressure response, and the patient died 13½ hours later. Vasopressor therapy was continued for from 5 to 231 hours. When the responses to Aramine and arterenol were compared, using each drug alone, it became apparent that on a weight basis Aramine was only about 0.05 to 0.04 as potent as arterenol when administered by continuous intravenous infusion to patients in shock. However, the blood pressure was much easier to maintain at a constant level than with arterenol. Thus it seems to have some advantage over arterenol. No sloughs resulted from its intravenous use. Compromised renal function was improved in that there was an increase in glomerular filtration rate, renal blood flow, and urinary output.

PATHOLOGY

Glomerulotubular Nephrosis Correlated with Hepatic Lesions: III. Production of Acute Glomerulotubular Nephrosis in the Rabbit by Means of Hepatic Surgery. C. N. Crowson, R. H. More and G. Frkovich. A. M. A. Arch. Path. **60:**85-94 (July) 1955 [Chicago].

In the second of a series of three reports on glomerulotubular nephrosis with hepatic lesions (reported in the same issue) a close correlation was established between glomerulotubular nephrosis and structural changes in the liver. The hepatic changes consist of acute and chronic lesions and vary from severe fatty metamorphosis, cirrhosis, and acute edema, through all stages of atrophy and minor necrosis to massive hepatic necrosis. The hypothesis is proposed that vasopressor materials accumulate in the systemic circulation during periods of hepatic insufficiency and produce renal ischemia. The correlation is felt to comprise part of the hepatorenal syndrome, and it is recommended that the syndrome, already nebulous and ill-defined, be extended to include these related phenomena. The third report describes an attempt to reproduce experimentally correlated hepatic and renal damage corresponding to the associated hepatic and renal lesions reported in human autopsy material in part 2 of this series. This was done by means of temporary occlusion of the hepatic vasculature in rabbits. The object of this procedure was to produce a state of acute hepatic insufficiency without jaundice. Glomerulotubular nephrosis was found to develop in 90% of these animals. A rather large number of the rabbits used in this investigation (43%) showed preexisting hepatic lesions of varying types and duration. These hepatic changes showed a 95% correlation with degenerative renal changes, causing major reorganization of the experimental groupings. A lesion identical with acute glomerulotubular nephrosis has been produced in two rabbits by direct renal ischemia. The proposed ischemic etiology of glomerulotubular nephrosis has been discussed in the light of the associated hepatic disorders, with the following possible sequence of events: hepatic insufficiency developing in the presence of a variety of lesions; the insufficient liver failing to detoxify some potent vasospastic material in the circulation; and this

agent producing selective arteriospasm in small renal vessels. The Masson trichrome stain is recommended by the authors for use in carrying out investigations of acute degenerative lesions of the kidney.

Virilizing Tumors of the Ovary: Anatomopathologic Study. P. Laffargue. Presse méd. **63:**959-961 (June 22) 1955 (In French) [Paris, France].

The author believes that the classic classification of arrhenoblastomas made by Robert Meyer in 1930 should be revised, since it is now established that the ovary normally secretes androgens. Virilizing tumors should be considered on the same basis as feminizing tumors, and it should be acknowledged that they arise from cells whose presence is not abnormal. There are male tumors of the ovary that may be regarded as tumors of the genital blastema. These contain epithelial cords and interstitial cells. Joint or isolated variations in these two types of tissue give rise to the various types of arrhenomas, mixed and pure. The mixed forms are less differentiated and the pure forms have a high degree of maturity; they contain Sertoli or Leydig cells. These pure forms are found in dystrophy or hyperplasia of the ovary in exact correspondence. This shows that the ovary normally has androgenic sources of which the pathological manifestations are hyperplasia and neoplasia, in the same way that it has estrogenic sources that are subject to the same pathological manifestations.

Exfoliative Cytology and Pulmonary Cancer: A Histopathologic and Cytologic Correlation. H. J. Spjut, D. J. Fier and L. V. Ackerman. J. Thoracic Surg. **30:**90-107 (July) 1955 [St. Louis].

Although it is generally accepted that the examination of pulmonary secretions for cancer cells is valuable, the authors attempted to investigate (1) the limitations of this procedure; (2) what information other than the report of positive, suspicious, or negative is gained by cytological examinations. They reviewed 501 cases of patients with histologically proved pulmonary cancers who were admitted to Barnes Hospital between July, 1948, and April 1, 1953. For tissue confirmation of cancer there were 318 bronchial biopsies, 95 other biopsies, 163 pneumonectomies, 35 lobectomies, 126 thoracotomies for exploration, and 35 autopsy examinations. In each of the patients at least one sputum or bronchial washing was studied for cancer cells. Thus, there were 905 sputum examinations for 424 of the cases, and 364 bronchial washings for 343 cases. Many patients had both types of examination. The cytological examinations yielded 243 positive, 53 suspicious, and 205 negative results. Thirty-one and six-tenths per cent of the bronchial washings were positive, and 27.1% of the sputa were positive. On a case basis the over-all percentage of positive reports was 57.8% and with an optimum number of specimens, 76.6%. The optimum number of sputa and bronchial washings for study was found to be three. Of the 318 bronchial biopsies 211 or 66.3% were positive. Only 28% of the positive biopsies were in the operable cases. The lower lobes yielded the highest percentage of positive smears (bronchial washings). The highest percentage of positive sputa was obtained from the left upper lobe. Cytological examinations are of value in the diagnosis of peripheral pulmonary cancers. Lesions 2 to 3 cm. in diameter and those larger than 7 cm. produced the highest percentage of positive smears. Patients with positive hilar and bronchopulmonary nodes yielded a higher percentage of positive bronchial washings than did those with negative nodes. Sputum examinations remained much the same for the two groups. Positive smears were obtained in 56.1% of the operable and 59% of the inoperable cases. With a positive biopsy, the number of operable cases decreased notably. In 59 of the operable cases, the cytology was the only positive tissue examination prior to operation. Thirteen frozen sections (with 11 positive) were asked for in these cases. Thus, 48 of the patients underwent resection with cytology as the sole tissue diagnosis. Typing of the positive smears was 79.3% accurate. Epidermoid carcinomas were correctly typed in 89.2% of instances, undifferentiated carcinomas in 76.2%, and adenocarcinomas in 39.3%. Two bronchiolar carcinomas were accurately typed from the smears.

RADIOLOGY

Tissue Injuries After Roentgen and Radium-Irradiation: II. Clinical Aspects. C. F. Koch. Nederl. tijdschr. geneesk. **99:** 1742-1746 (June 11) 1955 (In Dutch) [Haarlem, Netherlands].

This is one of a series of three papers on tissue damage from irradiation, the other two dealing with the radiological and pathological aspects respectively. The clinical aspects reviewed in this paper are based on observations on 80 patients, in 6 of whom carcinomatous degeneration resulted. Often the patient himself is responsible for skin damage from irradiation, in that he fails to admit to a new physician that he previously received irradiation therapy. The author comments on the appearance of the lesions and the changes that they undergo, such as secondary infections and malignant degeneration. He also mentions the long periods that may intervene between the original irradiation and the development of carcinoma; in one of the patients observed by him this interval was 30 years. Irradiation is very damaging in young children, growing bone tissue being particularly susceptible. The author concludes that the number of patients being damaged by irradiation is greater than is generally known. Ray damage has not been restricted to the early era of irradiation therapy, but damage by excessive dosage still occurs today. In the majority of patients in whom the author observed ray lesions, irradiation therapy had been given for nonneoplastic lesions, such as for hemangiomas, nevi, warts, articular pains, tuberculous lymphomas, and psoriasis. Possibly many patients who were irradiated for neoplastic lesions died before irradiation necrosis became manifest. Nonneoplastic lesions that will respond just as well to treatments other than irradiation should not receive irradiation therapy. Surgical treatment is the only effective treatment for lesions caused by irradiation. Modern plastic surgery produces results that are not disfiguring.

Experiences with Hysterosalpingography. L. Öhlinger. Wien. med. Wchnschr. **105:**451-452 (June 4) 1955 (In German) [Vienna, Austria].

Hysterosalpingography was performed with the aid of a viscous, water-soluble contrast medium [a diiodide pyridone compound with addition of a surface anesthetic and sodium carboxymethylcellulose (Ioduron S)] in 81 sterile women in the course of 11 years. Of the 81 patients, 47 (58%) had primary sterility and 34 (42%) secondary sterility. The average age of the patients was 32 years. In 29 women tubal obstruction was shown to be the cause of the sterility and in the remaining 52 at least one or both oviducts were patent. Of the 29 women with bilateral tubal obstruction, the tubes were occluded at the uterine end in 8 women (27%), at the isthmus in 5 (19%), and at the ampulla in 15 (50%); peritubal covering was shown in one (4%); and 18 women (22.22%) became pregnant after the hysterosalpingography. These results suggest that a therapeutic effect of hysterosalpingography may be considered besides its diagnostic value.

ANESTHESIA

Effect of Premedication with Chlorpromazine. O. Oljelund. Nord. med. **53:**734-736 (May 5) 1955 (In Swedish) [Stockholm, Sweden].

Laparotomy was done in 200 patients, of whom 100 received premedication according to Gordh, with 50 mg. chlorpromazine given intramuscularly together with an average of 4 mg. of morphine and 0.3 mg. of atropine. The 100 controls received preoperatively an average of 9 mg. of morphine and 0.4 mg. of scopolamine, 2 mg. of dilaudid, and 0.3 mg. of atropine. It was found that chlorpromazine reduced the amount of barbiturate necessary during anesthesia by 21%; the postoperative course during the first five hours was uneventful; and the frequency of vomiting was reduced by 36% and the amount of analgesics needed by 38%. Hypotension, sometimes associated with nausea, occurred in 10 cases but did not affect the operative or postoperative course.

QUERIES AND MINOR NOTES

EATING ACTIVE YEAST DAILY

To the Editor:—*A patient is fond of eating active yeast several times daily and claims that he feels better with this food supplement; however, several years ago active yeast was found by certain investigators to use up some of the vitamin contained in the food passing through the intestine. How much vitamin is destroyed by active yeast organisms in the intestine? Is it sufficient to justify the change from active yeast to inactive yeast as a source of essential nutritional elements, or does it make slight difference? Does active yeast reduce intestinal putrefaction?*

George A. Ury, M.D., National City, Calif.

Answer.—There is no question but what active yeast interferes with the absorption of thiamine, not only from the yeast itself but the thiamine supplied in the food. Undoubtedly the living yeast cells absorb thiamine and prevent its absorption by the host. This has been clearly demonstrated in human subjects by Garber and co-workers (*J. Nutrition* **38:**225, 1949). Whether thiamine deficiency will be produced due to the consumption of active yeast will depend on the amount of yeast consumed and how frequently it is consumed. The safest procedure would be to process the yeast in such a way as to destroy the vitality of the cells. This treatment would also render the other vitamins in the yeast available to the body. It is doubtful that a general statement can be made that active yeast reduces intestinal putrefaction. The intestinal microflora are so complex that different effects would undoubtedly be obtained under different conditions.

ULTRASONIC THERAPY

To the Editor:—*A veterinarian who has severe bronchial asthma insists on taking ultrasonic sound wave therapy to the chest for his asthma. This I am very reluctant to do in view of the potentialities of this type of therapy and the sparsity of clinical reports on its use in the treatment of asthma. Kindly advise.*

M.D., New Mexico.

Answer.—There is no rational explanation nor reason to expect, nor are there adequate controlled studies reported to demonstrate, that ultrasonic diathermy is useful in the treatment of bronchial asthma. On the other hand, the application of ultrasonic diathermy for therapeutic purposes is contraindicated about the heart and large autonomic plexus, such as those found in the chest.

PROPHYLAXIS OF RHEUMATIC FEVER

To the Editor:—*Please give recommendations as to drug and dosage for prophylaxis of rheumatic fever, both for an acute streptococcic infection and also for long-range seasonal therapy in an individual who is sensitive to both sulfonamides and to penicillin.*

H. Edward Hengen, M.D., Pattonville, Mo.

Answer.—In the presence of a definite sensitivity to penicillin and the sulfonamides, the use of tetracycline (Achromycin) is indicated. However, this drug is less effective than penicillin in eradicating streptococci, decreasing antistreptolysin formation, and preventing rheumatic fever. The average dose in the treatment of streptococcic infection is 10 mg. per pound of body weight, in four divided doses daily, for two days. This is followed by half the amount for a total of 10 days. For the prevention or prophylaxis of streptococcic infection with Achromycin, 2 mg. per pound of body weight should be given daily and continued to the age of 18, in a child. In patients above the age of 18, it should be continued for at least five years following the last attack.

ACUTE BACTERIAL ENDOCARDITIS

To the Editor:—*An 11-year-old boy has an interventricular septal defect. In December, 1954, he had mumps, and he never seemed to regain his former health. He was first seen on Feb. 2, 1955, because of malaise and easy fatigue. In addition to the typical Roger murmur and thrill, there was some pallor but no fever. The spleen was enlarged four fingerbreadths below the left costal margin. No petechiae were noted. Laboratory reports revealed the hemoglobin level was 68%, white blood cell count 8,150 per cubic millimeter, and red blood cell count 3,350,000 per cubic millimeter. Two weeks later, although he said he felt a little better, the patient was hospitalized, and examination again was essentially unchanged. His parents stated that for the past day he had run an intermittent afternoon and evening fever, but his temperature was always normal in the morning. Urinalysis was normal and sedimentation rate 12 mm. in one hour. The white blood cell count was 10,200 per cubic millimeter, hemoglobin level 70, and red blood cell count 4,120,000 per cubic millimeter. Differential revealed stab forms 1, segmented cells 42%, lymphocytes 55%, and monocytes 2%. Heterophil and agglutination tests were negative. During 10 days in the hospital, daily blood cultures were obtained, and to date they are all negative. There was a daily afternoon and sometimes evening temperature as high as 102.6, but usually averaging between 100 to 101. When discharged, the patient's sedimentation rate had increased to 28 mm. in one hour and there was a slight change in differential, with 3 stab forms, 51 segmented cells, 42 lymphocytes, and 4 monocytes. He felt better while in the hospital, and it was thought that his spleen decreased slightly in size. Chest x-ray was normal. One week after discharge his hemoglobin level was 70%, red blood cell count 4,160,000 per cubic millimeter, and white blood cell count 14,550 per cubic millimeter. He no longer ran an afternoon temperature but did have a low-grade temperature elevation each evening. No antibiotics have been given. The patient continues to gradually feel a little better. Is a diagnosis of subacute bacterial endocarditis justified? If so, what antibiotics would be suggested?*

M.D., South Dakota.

Answer.—Concerning the 11-year-old boy, this consultant believes that a patient with known congenital malformation of the heart and unexplained irregular fever of long duration, a large spleen, and an unexplained anemia should be treated for subacute bacterial endocarditis even in the absence of a positive blood culture. He should have a careful neurological examination to rule out the question of a brain abscess and then should be treated with large doses of penicillin, at least a million units a day for a week. If this ends his fever he should be given a six weeks' course of penicillin in large doses. If the above treatment for a week reduces his fever but does not cure it, the dose should be doubled or tripled and may be increased up to 10 million units per day. If that is successful, treatment with such doses should be given. If it has no effect, erythromycin should be tried, 200 mg. six times a day for a week, and, if that is effective, treatment continued for six weeks.

The answers here published have been prepared by competent authorities. They do not, however, represent the opinions of any medical or other organization unless specifically so stated in the reply. Anonymous communications and queries on postal cards cannot be answered. Every letter must contain the writer's name and address, but these will be omitted on request.

BLASTOMYCOSIS

To the Editor:—*In a man 25 years of age the diagnosis of blastomycosis was made by tissue examination of two pieces of tissue taken from his back and buttocks in September, 1954. For a while he had a cough, with some sputum, and had fever for two months. X-ray examination of the chest showed an area in the left hilus the size of a 25-cent piece. The last x-ray, taken Jan. 22, was negative. This patient has gained weight, has no fever, and does not cough or spit up. He was treated with saturated solution of potassium iodine. He took 90 drops three times a day for four months and is now taking 60 drops three times a day. What tests can I give to this man to determine if he is free of blastomycosis?*

Wallace D. English, M.D., Cardwell, Mo.

Answer.—In blastomycosis, as in any other infectious granuloma, such as tuberculosis or syphilis, it is impossible to determine whether the patient does or does not harbor living micro-organisms after clinical cure has been achieved. In the case of blastomycosis, one obtains the best orientation from the complement-fixation test. For technique, specificity, and literature see Conant and others (Manual of Clinical Mycology, Philadelphia, W. B. Saunders Company, 1954). If the test is negative, treatment can be discontinued because negative complement-fixation test indicates inactivity of the disease. However, the patient should remain under observation for many years, and the complement-fixation test should be repeated periodically. The blastomycin skin test usually remains positive after clinical cure, like the tuberculin test in tuberculosis. It has been found that a positive skin test combined with a negative complement-fixation test is a prognostically favorable sign.

HOW TO OBTAIN SERUM FROM CLOTTED BLOOD

To the Editor:—*A blood sample withdrawn from a young pregnant woman clotted solidly as soon as it was transferred from the syringe to a glass tube. There was no separation whatsoever of serum from the clot. The laboratory reported that no readings could be taken. On a second sample an attempt was made to separate serum from clot by centrifugation after refrigeration but to no avail. Can you suggest a method for obtaining a serum sample to be used for blood type, Rh, and serology tests?*

Thomas N. Geracioti, M.D., Spencer, Ohio.

Answer.—After the blood has clotted, gently rim the clot with an applicator stick and centrifuge at high speed. This may have to be repeated once or twice but should provide serum for blood type, Rh, and serology tests. If necessary the tests can be performed on oxalated blood by washing the cells with saline solution. A platelet count should be done, as a thrombocytopenia may account for the absence of clot retraction. If necessary, blood may be drawn in siliconized syringes and injected into siliconized tubes, centrifuged, and then allowed to stand at room temperature or in the refrigerator for approximately two hours, at which time the blood will clot.

CARBON TETRACHLORIDE POISONING

To the Editor:—*Has carbon tetrachloride poisoning, either chronic or acute, ever been proved to cause any type of insanity or mental disturbance?*

John T. Bate, M.D., Louisville, Ky.

Answer.—Prolonged psychotic states are rare as a result of carbon tetrachloride poisoning and perhaps do not occur at all. Neurological damage is more in evidence chiefly from damage to the optic nerve. However, in acute intoxication from carbon tetrachloride many mental symptoms have arisen and, in fact, are quite commonplace. In his book "Poisoning" (New York, Paul B. Hoeber, Inc., 1952) von Oettingen states the situation: "Acute carbon tetrachloride poisoning is dominated by symptoms from the central nervous system. The patient suffers from dizziness, inebriation, mental confusion, nervousness, and, less frequently from loss of memory. He may become delirious and suffer from convulsive seizures. Finally he becomes unconscious, stuporous, and comatose. In prolonged poisonings peripheral neuritis may develop with pareses, paresthesias, anesthesias, and tremors. The reflexes may be exaggerated or decreased. Vestibular disturbances may be present. Not infrequently the vision is blurred and there may be diplopia, amblyopia, and amaurosis."

FETOR HEPATICUS

To the Editor:—*Please describe fetor hepaticus. Is it usually accompanied by excessive dryness of the mouth?*

Arthur R. Timme, M.D., Los Angeles.

Answer.—To describe a smell in words is possible only by the use of analogy. This is of little help if the reader is not familiar with the odor to which fetor hepaticus is compared. Descriptions one finds in medical writings include the terms "rancid," "sour-sweet," "pungent," "like the smell of new mown hay," and perhaps the most remarkable is likening the smell to that of a nest of mice freshly turned up in a barn. The fact remains that to describe color to the colorblind, or music to the tone deaf, or fetor hepaticus to someone who has never smelled it is a literal impossibility. The material responsible for this odor is probably a complex chemical compound of the piperidine group. The smell is very nearly like but not identical with the odor of α-methylpiperidine. This material is found in high concentration in the urine of patients with severe parenchymal liver disease who have fetor hepaticus, less often in the urine of patients with obstructive jaundice. In fact it occurs in normal urine but in very much smaller amounts than in urine from patients who exhibit fetor hepaticus clinically. Fetor hepaticus is not usually or frequently associated with excessive dryness of the mouth. Such dryness may result from mouth breathing in patients who have coma along with fetor.

REACTION TO HORSE SERUM DURING PREGNANCY

To the Editor:—*Is there any evidence that a serious reaction to horse serum and the treatment of this with 200 mg. of cortisone daily for five days would have deleterious effects when occurring during the first month of pregnancy?*

M.D., California.

Answer.—Serious serum reactions have occurred in pregnancy without adversely affecting the fetus. Cortisone has been administered in amounts of 200 mg. daily for longer periods than five days in pregnancy without apparent harm to either the mother or fetus.

VISUAL LOSS FOR COMPENSABLE EYE INJURIES

To the Editor:—*The first part of the answer to Dr. Holohan's query in* The Journal, *April 9, 1955, page 1360, reveals a striking disparity in current evaluations of the Snellen notation and points up anew the need for a sound and equitable procedure for the solution of this problem. Having in earlier communications outlined the rationale establishing the Snellen symbol as inherently a true fraction, to arrive now at the actual measure of the intrinsic values connoted by the Snellen visual expression one must recognize that by the very nature of things it is not the fraction, i. e., visual angle itself, being dealt with, as set forth in the depicted table, but instead the subtended surface area of this fraction or angle. The principle of construction of the Snellen symbol is two-dimensional, the projected test object having height and width of equal size, viz., all four sides subtended by the same visual angle in minutes of arc; hence, in the final analysis, concern obviously is with the value of the area of some specific square, either that of the whole or of a related part. When given, then, as previously shown, any one dimension or aliquot part thereof squared, the resulting figure will represent the value sought. The evolution of an objective formula, such as this, is sound and correct, and a visual efficiency rating based on the square and not the linear unit as the determinant of Snellen visual values is, besides, a valid and appropriate concept.*

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